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Why Textile Research?*

E. H. KILLHEFFER†

MY connection is, as you know, with an organization outstanding for its recognition of the value, yes, the absolute necessity of research. If therefore I convey to you some idea of this viewpoint, you may be able to draw some helpful analogies.

Scientific research is necessary in any industry that would preserve its present and seek to assure its future. Some of the most outstanding industries we can call to mind are established on this principle.

The textile industry has been slow to embark on a regular research policy. This has been true the world over but latterly in several countries textile research is well launched. Great Britain, as you know, is far ahead of us and even Japan is now getting started. In the United States the effort lags.

This Institute was founded for the sole purpose of promoting co-operative textile research here. Sad to relate there would have been no start at all in actual research if it had not been for money grants from the Textile Foundation, the Chemical Foundation and one or two textile manufacturers. Several important researches are now being conducted. They are supported financially by these grants and subscriptions from directly interested textile people.

What is needed is an awakening of the entire industry to its genuine need for a comprehensive research program.

HOW WILL RESEARCH AID IN PRESERVING THE PRESENT?

Certainly we cannot know too much about the materials with which we are working or the processes through which we put them. How much really do we know about cellulose? And how much about wool? The fact is we know very little. As we learn more about the materials and their behavior under varying conditions our processes often change. Perhaps some processes should be radically changed and possibly others omitted altogether.

This is not done in a moment. Invariably there must first be fundamental scientific research, the results of which lead to applied research and then finally reduction to actual mill practice. Time and money are required. No one mill organization can afford the financial burden. Co-operatively, the burden can be light. If the textile industries of other nations go after the fundamentals in this way, how can the American industry expect to hold its place if it neglects the opportunity? Research will aid in preserving your present.

HOW RESEARCH WILL AID IN ASSURING THE FUTURE

Do you think there will be no developments of things entirely new? Of course you don't. They will not be pulled, like rabbits, out of a hat. They will come as the result of painstaking study. Rayon didn't just happen. Who knows but what some bright mind will make a textile fabric much after the fashion that paper is made today, avoiding spinning, weaving, etc., or perhaps a way will be found, with the aid of proper buffers, to introduce wool into viscose just before it is extruded into threads or sheets. Perhaps some new treatment will make virtually new fabrics. When much more is known about the various fibers new possibilities are bound to open up. The research workers find and record a great mass of new facts which often are totally unrelated.

This is the fundamental part. It then remains for the practical man in industry, chemist, physicist or engineer, to study these new facts and make practical application of them in his own plant. The future is an unknown chamber. Research is the key with which to unlock it.

The attitude of mind of a large part of the textile industry is apparently something like this: Research may be beneficial but we will wait and see what practical benefits, if any, come from the present studies and if, when and as there are any such benefits, we will join up and help support the work, or, we have our own research department and whatever useful information we develop is for our own use; or, we are just struggling along one jump

*Address before Annual Dinner, U. S. Institute for Textile Research.

†E. I. du Pont de Nemours & Co.

ahead of the sheriff now; how can we support financially a research program?

The first group wants to be shown something tangible. This really is a shallow pretense. Surely no person claiming to be even fairly well informed can truthfully say that he doesn't know of any number of extremely practical developments which have resulted from painstaking research study.

Mechanical refrigeration is a result of much study of the fundamentals of insulation and of refrigeration. Then manufacturers of stoves applied some of the results of the insulation research and today we have cook stoves of an efficiency undreamed of a few years ago. We may know little of the intricate problems of electrical research but we certainly can see plenty of evidence all about us of the successful culmination of those researches. Could these things be, unless someone had become dissatisfied with the knowledge he possessed and decided to search out more of the why and wherefore and had the faith to believe the effort would be worthwhile?

With such examples as rayon, which certainly is no stranger to the textile industry, how can the industry honestly be skeptical of the benefits of research?

As to the organization that has its own research, what commercial textile organization can afford a research into fundamentals and how could a single organization cover so vast a field? Fundamental research is expensive. There must be a personnel adequate in training and number. Costly physical facilities must be provided and besides, much time is required. Older textile industries than ours have realized that the only feasible answer was co-operative research. As a result they could have the best trained people, equip them with proper facilities and cover a wide enough field. The Japanese, whose textile industry is much younger than ours, have been quicker to adopt this idea than we. The mill with its own research department is just in a better position to utilize any results of cooperative research.

Now for the much larger group who cannot afford the financial burden; it's all in the point of view. They continue to meet their power bills because they know they can't operate otherwise. They do not come in and make themselves a part of a big research program because they do not view it as essential.

Suppose the state department were to announce their intention of making a drive to increase exports of raw cotton and that they would propose in connection with this to reduce the tariff, which now protects the American cotton manufacturing industry, so as to make it easier for the purchasers of our raw cotton to ship into this country the fabrics manufactured from it. I think within a week the whole industry would be up in arms and willing to co-operate in any way that might seem to aid in their self-preservation against such a threat. They would recognize an imperative need to co-operate.

If every textile mill contributed or was assessed one-tenth of one percent of its annual sales the resulting fund would be approximately $2,500,000 per year. What a job of self-preservation, through research, could be done with that amount. By way of comparison the research expenditure by the organic chemical industry in the United States equals approximately 5 per cent of dollar sales. The financial load would not be heavy if all the industry helped.

I mentioned your tariff protection. There is a thread to all Occidental industry and more particularly and immediately textiles. We are witnessing today something entirely new and very different from anything we have ever known—the industrialization of the Far East. It is unlike our similar development as a competitor of Europe. We were the same people with the same standards of life and our equipment initially at least was inferior.

In the Far East it is different. Their standards of life are not ours. It is not a question of whether higher or lower; it is vastly different and much less costly. And besides, they do not have inferior equipment but instead the latest and most improved. This it seems to me will compel us, whether we like it or not, to evolve some new system if we are to survive. Yes, the tendency over the years will be for their standards to more nearly resemble ours, but that will take a long time, if indeed our ideas of living are desirable from their point of view.

You must not lose sight of the fact that every time a tariff rate is reduced to some European country, that same reduction is extended automatically to Japan. Obviously, a rate that is just sufficient to protect us against European competition is totally inadequate protection against the industries of the Far East.

You in the textile industry think you know something already about this serious threat from the Orient. In my opinion you have only witnessed the beginning. Here is where research and tariff are interwoven. You must have one if you are to have the other. Without tariffs that protect you against abnormally low cost nations, you cannot support a research program financially. Without research that will keep you abreast of the times you can less easily justify tariff protection.

Mr. Hull puts the cart before the horse. He reduces tariffs not because we are independent of them but because in theory there should be no artificial barriers to trade. What he and all advocates of the present brand of Reciprocal Trade Agreements overlook is the fact that we in the United States have followed precisely this theory for many years. That is why we have the largest free list of any important nation. We have recognized that duties on such things as tea, coffee, rubber, etc., would be unnatural barriers because we do not produce them, hence they are on the free list. A tariff that protects the jobs of American workmen in already existent industries cannot fairly be called an unnatural barrier. It must be remembered in this connection that the textile industry is one of the largest employers of labor.

Your only chance of lessening your dependence on tariffs is to be far in advance of others in quality and

production cost. As an example of such an industry we might cite the case of the automotive industry of the United States. If you are to be less dependent on tariff, it will come about through revolutionary developments which in turn are products of research.

Will you not spread this call throughout your large and important industry? The job can be done. It needs the support, financial as well as moral, of the entire textile industry.

I can close this short address in no more fitting way than to quote a paragraph from an address of Dr. C. M. A. Stine, Vice-President of the du Pont Company on the subject "Science in Industry." He was referring to agriculture but his conclusions are equally appropriate to textiles.

"Here, verily, is unlimited opportunity for more science in industry. Let us see to the use of more fundamental as well as applied science in industry, as one sure means of assisting in determining the kind of a future our industries may confidently expect."

Current Research of U. S. I. T. R.

CHARLES H. CLARK*

U. S. Institute for Textile Research, Inc., promotes and engages at present in three types of researches: (1) Studies selected by its Research Council and recommended to educational and other institutions having the requisite personnel, facilities and finances, the Council acting in an advisory capacity and undertaking to publish reports of results, if found worthy. (2) The organization, promotion and supervision of studies wholly financed by a foundation, a company, an individual, or by U. S. Institute, and the publication of results of such studies. (3) The organization, promotion and administration of co-operatively financed researches, the reports of which during progress shall be available only to contributors, and shall not be published until one year after completion of the study.

CO-OPERATIVELY FINANCED STUDIES

Until May, 1934, when U. S. Institute obligated itself to undertake the co-operative financing of a study of warp sizing and sizing materials, its research work had been restricted by the general business depression and the lack of funds to studies of the first type. The conference method by which the organization of the third type of research is approached is believed to be vitally important in promoting interest in the subject, in defining the character of the study and in aiding its financing. A study of textile drying is the second of the co-operatively financed researches to be undertaken, and resulted from a conference on this subject held last May. Both of these co-operatively financed studies are for a two-year period and require a fund of $10,000 each. The warp sizing study was financed on a 50-50 basis by the Textile Research Institute with the aid of the Textile Foundation; the textile drying study is being co-operatively financed wholly by the Textile Research Institute and that financing is now approaching completion.

Reports of researches of the first and second types are made public either during progress or when completed, whereas progress reports of cooperatively financed researches are available only to co-operators and other contributing members of Textile Research Institute, and to them confidentially; no public report of findings is published until a year following completion of such studies. This policy has been found necessary in order to encourage subscriptions and to recompense those who make possible the financing.

AN ECONOMIC STUDY

Falling under the second type of research is the study of "Trends in Production and Distribution Organization in the Textile Industry," which is wholly financed by the Textile Foundation for a sum not exceeding $20,000, and has been in progress at the Wharton School of Finance and Commerce, University of Pennsylvania, since last June. This study was planned and suggested to the Textile Foundation by our Committee on Economic Research, of which F. S. Blanchard is chairman. The Committee selected the Wharton School, acts in an advisory capacity and has the co-operation of a dozen leading textile associations.

THE WARP SIZING RESEARCH

The co-operative study of warp sizing and sizing materials is now in its second year, and is engaged at present in laboratory and experimental mill research on sizing of viscose-process rayons and the materials employed therein. This second phase of the study follows an initial study of starches as sizing materials, and the latter eventually will be resumed for the purpose of correlating preliminary results with slashing, weaving and desizing. The confidential progress reports that have gone to co-operators thus far bear the following titles: (1) "The Changes in Viscosity of Starch Pastes Through Continued Heating and Stirring, in Relation with the Sizing of Cotton Yarns;" (2) "Thin-boiling and Oxidized Starches;" (3) "Different Ways to Make the Viscosity of Potato Starch Pastes More Stable Against Heating;" (4) "Effects of Various Types of Size on Viscose Rayon Warps."

The Research Council controls all research work and policies, excepting the financing, which latter must be re-

*Secretary, U. S. Institute for Textile Research, Inc.

ferred to the Executive Committee of Textile Research Institute. An administration committee has direct charge of each study. The administration committee for the warp sizing study has the following membership: Wright Bolton, Chm., Dr. J. B. Quig, Dr. H. A. Neville; that for the textile drying study has the following membership: W. E. Emley, Chm., Alban Eavenson, Dr. H. DeW. Smith.

Laboratory work for the warp sizing study is in progress at Massachusetts Institute of Technology with Dr. William E. Yelland as director and Prof. E. R. Schwarz as contact man; mill experimental work is in progress in the rayon division of Pacific Mills, Lawrence, Mass. Selection of a place and director for the textile drying study will await completion of the financing.

STUDY OF TEXTILE DRYING

The revised research program for the textile drying study was presented at the recent annual meeting of the Textile Research Institute and involves a new type of service that seems likely to become a permanent feature of co-operatively financed researches. At such time as research results that seem worthy of practical application are available, the director of the study will be prepared to visit co-operating mills and act with the latter's technicians in an advisory capacity. During recent years this type of service has been one of the principal functions of the British Cotton Industry Research Association. The revised research program for the textile drying study is as follows:

Purpose: To ascertain some of the fundamental facts underlying the design of drying equipment for textiles. To develop information about the way textiles can be dried with maximum efficiency and minimum injury to the material. To assist in applying this information in individual plants.

Problems: (a) *Regain.* Samples of each of the textile fibers, as nearly pure as can be obtained, will be analyzed to ascertain their purity for the record. They will be dried or humidified in a laboratory oven, in which the temperature, humidity, and circulation can be closely controlled. The amounts of regain (both adsorption and desorption) will be determined at all temperatures from slightly below room temperature to as high as the fiber will stand.

(*b*) *Effect of Regain.* Samples of each fiber containing widely different amounts of water will be studied to establish a criterion for measuring the difference between them. This may be found to be a difference in chemical composition, in tensile strength, in flexibility, in ability to absorb dyes, or in some other property.

(*c*) *Effect of Machine Variables.* Certain factors encountered in commercial dryers will affect the rate at which equilibrium is reached and the properties of the dried fabric. The laboratory oven will be used to study the effects of such factors as speed of circulation of air, sudden increases of temperature, drying in contact with metal, intermittent drying, etc.

(*d*) *Effect of Impurities.* Textile fibers are seldom used in the pure state. The laboratory oven will be used to study the effects of additions of starch or gelatin sizing materials, dyestuffs, finishing materials, variations of pH, etc.

Method: A Ph.D. physicist will be employed and given laboratory facilities to start work on problem (a). By the end of the first year, he should have problems (a) and (b) completed. At the beginning of the second year, this information will be ready for application in individual mills. Any mill desiring to take advantage of the opportunity will be expected to furnish its own equipment and personnel, the physicist acting merely in an advisory capacity, with trips to the mill as required. At other times he will continue his laboratory work on problems (c) and (d).

Cost: One man plus equipment, supplies and travel, at a total of $5,000 a year for two years. This is based upon the assumption that the work will be set up at some place where the necessary space, light, heat and usual equipment will be furnished gratis, where the work can be properly supervised, and where men experienced in drying problems can be called on for advice.

Research Work of A. A. T. C. C.

LOUIS A. OLNEY*

ONE of the objects of the American Association of Textile Chemists and Colorists, set forth in the Constitution reads as follows:

"To encourage in any practical way research work on chemical processes, and materials of importance to the textile industry."

From the beginning of the Association 15 years ago, the spirit of this clause has been looked upon by a large majority of our members as the foundation, upon which the permanence of our organization rests.

In the 1923 Year Book, four sub-committees engaged in Dye Fastness Standardization were recorded. In the 1935-36 Year Book there are recorded twenty-seven subcommittees actively working under the direction of the Research Committee and in addition there are at least

*Chairman, Research Committee, A.A.T.C.C.

three more in the process of organization. Again in 1923 (two years after the organization of the association) no full time research associates were employed, but in the 1936 Year Book, the names of nine are recorded. In 1923 less than two hundred dollars was spent upon the activities of the Research Committee, while during the current year more than twenty thousand will have been spent.

The mere expenditure of money however means nothing unless something worthwhile has been, and is being accomplished. On pages 83-85 of the 1935-36 Year Book there will be found a list of 38 papers and reports which have already been published, and these together with the many standard methods for dye testing and textile laboratory methods appearing in the same volume serve as a more or less complete record of the committees' activities. A brief description of the present and recent work may be of interest to those who are research minded.

The activities of the Research Committee may well be described under three headings:

1. Standardization of different types of color fastness of dyed textile materials.
2. Formulation and study of laboratory test and analytical methods.
3. Research (fundamental and applied).

In this grouping there is necessarily some overlapping, particularly between 1 and 2, but in general the three are reasonably well defined.

1. STANDARDIZATION

At the present time the Standard Methods of Determining the Fastness of Dyed Cotton to Washing and Laundering are being reviewed and critically studied with the object of correlation with the British Standards, recently proposed by the "Society of Dyers and Colourists."

The same may be said of the Standards for Light Fastness. During the past two years FadeOmeter and sun exposure tests have been made of the British and German Light Fastness Standards at the National Bureau of Standards in Washington. As soon as this work is completed, an effort will be made to establish mutually satisfactory International Standards.

The Association method for determining Fastness to Perspiration has been checked carefully with those proposed in England and Germany and at the present time we believe our own should stand. Notwithstanding this belief the committee is convinced that there is a demand for a modified optional test covering a comparatively wide range of dyed materials which in the strict sense of the word are not wholly fast to the action of perspiration, but which are satisfactory for many purposes, where extreme requirements are not demanded. Such an optional test is being formulated at the present time.

During the past year the Association method for the determination of Fastness to Crocking has been greatly improved through the introduction of a standard testing machine known as the "Crock Meter," devised by Walter C. Durfee, one of the members of the committee. This is illustrated and described in the 1935-1936 Year Book, pages 129-132.

2. LABORATORY TESTS AND ANALYTICAL METHODS

One of the most important accomplishments of the past year, recorded under the heading of laboratory tests and analytical methods was the devising of a satisfactory method for the direct determination of wool in the presence of cotton. This was worked out by Bertil A. Ryberg at the Lowell Textile Institute, and was one of the projects supported by the Textile Foundation.

This method has the advantage of determining wool directly instead of by difference and by its application it is possible to quantitatively determine wool in the presence of regenerated cellulose rayon, acetate rayon, tussah silk and real silk. A full description of this work will be found in the AMERICAN DYESTUFF REPORTER, June 1, 1936, Vol. 25, pages 296-302.

For some time textile chemists have realized that the existing knowledge regarding the accompanying substances of raw wool, also, just what takes place when wool is extracted with different reagents, was not as exact or complete as it should be. With this in mind a research project is under way, the object of which is to obtain further facts and if possible clarify this rather unsatisfactory situation. The committee investigating this subject, under the chairmanship of Hugh Christison, believed that this work should begin with a thorough study of the material obtained when wool is extracted with ethyl alcohol. This research is well under way at the present time and the experimental work is being carried out by Bertil A. Ryberg at the Lowell Textile Institute. It is being supported by a grant from the Textile Foundation.

The study of methods for the commercial grading and analysis of sulfonated oils which under the guidance of Ralph Hart has extended through several years has resulted in the most complete and scientifically set of procedures that has as yet been recorded. Further work upon this subject is about to be published.

Another recently appointed committee under the chairmanship of Kenneth H. Barnard is studying the crease resistance of fabrics with the object of devising a suitable method for evaluating the anti-crease qualities of a fabric from the consumer's viewpoint. The scope of this committee has furthermore been broadened to study the degree of permanence of different finishes and if possible devise a method for determining their relative value in this respect.

The Sub-Committee on Analytical Methods under the chairmanship of Walter M. Scott has revised, and extended the list of methods which was published several years ago, and it now includes 110 different procedures, all of which have been published in the 1935-36 Year Book. The committee has it in mind to revise and add to these from time to time and it is expected that this will in time constitute an exceptionally complete and officially recognized collection of analytical methods for the textile laboratory.

3. RESEARCH

Fundamental and Applied

It has been the policy of the research committee to promote not only fundamental research, but as soon as this is productive of results to endeavor to apply the facts and principles thus established to the textile industry in a practical way.

The study of the Wool Carbonization Process, which extended over several years, was an excellent example of this policy, and at the present time, three distinctively different research projects are being conducted along similar lines. These include the Study of the Chemistry of Wool, Textile Printing Pastes, and the Mercerization of Cotton.

Chemistry of Wool Fiber

Believing that but little further progress could be made in studying the fundamental chemical principles involved in the scouring, bleaching, dyeing, and finishing of wool fabrics, until more was known of the chemical composition of wool fiber, a Sub-Committee of the Chemistry of Wool Fiber was organized about two years ago under the chairmanship of Alban Eavenson. The work of this committee has been generously supported by the Textile Foundation, the Chemical Foundation, and the Eavenson & Levering Company.

Work already accomplished has been so far-reaching and extensive that any attempt to describe it in a condensed way would be inadequate. The Iso-Electric Point of Wool, and the Iodine Number of Wool have been determined and an extensive study made of the Action of Alkalis on Wool. More recently attention has been turned to a study of the chemical structure of wool, which has included a study of the Sulfur Lability in the Alkali Degradation of Wool Protein, the Chemistry of the Oxidation of Wool, and the Effect of Alkalis upon the Sulfur Content of Wool.

A number of practical applications of the facts derived from these studies have already been made. It has been found, that even slight chemical changes in the wool protein renders the wool fiber susceptible to deterioration and damage during subsequent process or use, although such incipient damage may not be detectable by optical observation, or the customary physical tests. A method has been devised whereby simple chemical tests conducted under controlled conditions, will detect such inherent damage and guide the dyer and finisher in the control of subsequent processes. Chemical modifications of the constitution of wool substances have been found to have a direct bearing upon the elasticity of wool fiber.

Strange as it may seem, there exists a rather close relationship between the study of the chemistry of wool fiber and one line of cancer research. This is due to the fact that both involve an intimate and exhaustice study of similar protein substances and amino acids.

The work on the Chemistry of Wool is being conducted at the present time by Milton Harris, Arthur Smith, Henry A. Rutherford and Arnold Sookne at the U. S. Bureau of Standards.

Vat Printing Pastes

The work which is being conducted by the Sub-Committee on Textile Printing Pastes under the chairmanship of William H. Cady has attracted wide interest. This is one of the projects being supported by the Textile Foundation, and the research work is being conducted by Sivert N. Glarum at Brown University.

Soon after the inauguration of this work, it was found that any investigation of printing pastes particularly vat printing pastes must include not only a study of the printing operation, itself, but also, the fixation or ageing of the dyes after printing. Up to the present time this investigation has involved a study of the various thickeners, and pastes from the point of view of consistency, rinsibility, penetration, color value, flowing properties, and methods of evaluating these properties. Considerable time has also been spent in an investigation of the causes of the rise in temperature which takes place when vat colors are being aged. Dr. Glarum has examined several hundred samples of printing pastes taken from five different print works, and by studying their properties has been able to devise methods for determining, before a printing color paste leaves the color shop, whether it possesses the proper flowing properties, to enable it to print satisfactorily. This has proved to be of great advantage to textile printers in that it eliminates time consumed and cost of experimenting after the color paste arrives at the printing machine. Details of this work may be found in reports published in the AMERICAN DYESTUFF REPORTER, March 26, 1934, pages 85-89, and March 23, 1936, pages 150-157.

Mercerization

About two years ago a Sub-Committee on Mercerization was formed consisting almost entirely of members from the Southern Sections. This committee was originally under the chairmanship of Prof. Charles B. Ordway, of the Alabama Polytechnic Institute, but quite recently owing to a change of position by Prof. Ordway, the chairmanship has been taken care of by Harold M. Schroeder. Most of the experimental work has been done by Sidney M. Edelstein working at the University of Chattanooga assisted by Wm. H. Pope, and some work also at the Alabama Polytechnic Institute by Lee R. Ellenburg.

A study of the Barium Hydroxide Absorption Method originally proposed by S. M. Neale for the determination of degree of mercerization has been thoroughly studied and a modification of this method found satisfactory for use in the presence of dyes.

A detailed study has also been made of the effect of the concentration of the mercerizing caustic soda solution and the properties of the mercerized yarn produced under these varying concentrations. The luster of the mercerized samples increased with an increase in caustic concentration up to 80° Tw. and the luster obtained appeared to be related to the force exerted by the yarn when prevented from shrinking in the caustic soda solution. It was also found that the equilibrium dye absorption, moisture absorption, barium hydroxide absorption and tensile

strength of the mercerized samples increased only up to a concentration of 30° Tw. The effect of varying the shrinking and stretching of yarn during mercerization has also been thoroughly studied. Further studies are being conducted at the present time which will investigate the effect of temperatures of the caustic soda solution during mercerization and of the impurities which may be present in the caustic soda as for instance sodium carbonate and the pectin material which may accompany the caustic or be derived from the accompanying substances of raw cotton. Extensive work is being conducted in connection with a method of measuring the degree of luster which is developed on cotton yarn under the varying conditions of mercerization.

An experimental mercerizing unit has been installed by means of which cotton, in the form of yarn, can be mercerized under closely controlled conditions. Details of this work may be found in reports published in the AMERICAN DYESTUFF REPORTER April 6, 1936, pages 186-190 and August 24, 1936, pages 458-466. A further paper is in the process of publication at the present time.

Chemistry of Cellulosic Fibers

The work previously described as being conducted upon the chemistry of wool fiber has led to many calls for a similar line of investigation of cotton and the other cellulosic fibers. Recent years have seen extensive investigation of cellulose itself, but little has been done in the way of studying the reactions which take place between cellulose and the various reagents with which it comes in contact during bleaching, dyeing and finishing processes. It is believed that a line of investigation similar to that being conducted upon the chemistry of wool fiber would present a profitable field. With this in mind a sub-committee upon the Chemistry of Cellulosic Fibers is in the process of formation at the present time with H. D. W. Smith acting as chairman.

Cooperative Research Projects

In addition to the research work outlined above which is being conducted purely as AATCC activities, the association is engaged at the present time in a research project in cooperation with the Throwsters Research Institute, under the chairmanship of B. L. Hathorne.

This project is being supported by funds appropriated in equal amounts by the Textile Foundation and the Throwsters Research Institute. The work has been progressing for more than a year and has resolved itself into "A Study of the Creping of Rayon Fabrics". It is expected that this study will be finished early next year when a complete report will be published in the Proceedings of the AATCC.

The rapid growth of the research work of the AATCC has been due to the generous support of the Textile Foundation, the Chemical Foundation, the Eavenson and Levering Company, and the many other textile and dyestuff companies that have contributed through Corporation Memberships.

In addition to this acknowledgment of financial support, great credit and appreciation is due to the untiring efforts of the members of the Research Committee particularly those who have acted as chairmen of the various sub-committees.

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Recent Developments in the Rayon Dyeing and Finishing Industry

B. L. HATHORNE

AS the bulk of the recent developments of importance in the rayon dyeing and finishing industry have taken place within the ladies' dress goods field, this paper will be confined to a discussion of recent developments in this field.

SOUTHWARD TREND OF INDUSTRY

Of foremost importance is the decentralization of the industry that has already taken place. The many plants now firmly established outside of the Paterson area have definitely exploded the old theory of the necessity of dyeing and finishing of dress goods being done close to New York, to facilitate quick delivery. That deliveries from New England and from the South have, for the most part, been satisfactory is proven by the tremendous yardages of fabric successfully shipped from these two sections.

Whereas the Paterson labor difficulties gave this movement away from Paterson its original impetus, labor troubles alone are by no means the sole reason for slow departure of this industry from the metropolitan area. Poor workmanship on the part of many firms that reduced prices unduly and then "cut the corners" in order to meet the price, hastened the decision of certain of the fabric producers to take their greige goods out of this dangerous position.

Another contributing factor is the attitude of certain of the converters who have handled their business in such an unethical manner that fabric manufacturers have been forced directly and indirectly into the converting business.

This movement has already had the effect of reducing to some extent unjust claims on the part of converters and has also had the effect of causing manufacturers to be directly interested in dyeing merchandise sold in dyed form by them or directly for their account through "connections"

The preliminary troubles of many of the firms that started in this business outside of Paterson, troubles that should logically be expected in any new enterprise, and that have already been reduced to non-important levels,

had the effect of causing the Paterson interests to assume that the initial movement was doomed to failure and undoubtedly contributed toward their lethargy in failing to correct their own conditions in time to stop this movement.

It is now obvious that the movement is only well started and that a steady development of the industry may be expected in the South, primarily at the expense of the Paterson dyeing area.

ACETATE DISCHARGE PRINTING

Whereas acetate discharge printing has been possible for many years and has been practised at intervals, it is only during the past eighteen (18) months that proper technique has been developed that enables acetate and viscose crepe fabrics to be printed with a reasonable assurance of production of a normal percentage of first quality merchandise in all colors.

The practise employed is simple enough and employs nothing new. The only new feature is development of proper technique.

Acetate warp viscose fill crepe fabrics boiled-off in the usual manner, are partially saponified slowly by the addition of alkali under controlled conditions of concentration, temperature and time, the process being regulated in such a way that a definite percent of the acetyl radicals of the acetate itself are removed by the process. This treatment puts the fabric into such a condition that both acetate (partially saponified) and viscose may be dyed the same shade with specially chosen viscose dyestuffs.

The fabric can then be discharged, printed in the customary manner.

As might be expected, the finished fabric is somewhat different in hand than an acetate viscose crepe that is simply dyed and finished in the usual manner. In the first place, part of the actual substance of the cloth has been removed by the partially saponified process. This makes the fabric "thinner" in hand. In addition, the extra processes the fabric is subjected to cannot help but change its hand somewhat.

Finishing technique (primarily use of certain of the sulfonated higher alcohols) has gone a long way towards overcoming this changed hand of the fabric and has resulted in production of excellent feeling fabrics by this process. Considerable growth along this line is expected.

LACQUER PRINTING

Few in the industry realize the extent to which direct printing of ladies dress goods has actually been accomplished by the lacquer process during the past two years. This is because the bulk of the lacquer printed fabric that has appeared on the market has been sold simply as printed fabric, not as lacquer printed fabric.

Lacquer printing technique has developed to the point where large blotch patterns have been produced commercially without any trace of stiffness being detected in the printed portions by people constantly handling fabric.

The "secret" behind this development has been the development of proper plastic-sizes for the lacquer that have made lacquer films as flexible as the yarns themselves in the fabric and at the same time have assisted in binding the lacquer firmly to the fabric.

At present the only fly in the ointment of the lacquer printings is the limitations of the dyestuffs available. This situation, however, has received considerable attention from merchandisers of dyestuffs and is rapidly being overcome.

Whether the partially saponified acetate discharge processes or the lacquer process will become the most important remains to be seen.

If all the obstacles can be overcome, it is logical to expect the lacquer process to be the victor, because the fabric can be taken from the drying unit of the printing machine, inspected and shipped directly. At the most it needs only a button breaking treatment.

Obviously, the greatest single cause of defective merchandise in printing, the ageing process, cannot cause defective merchandise in lacquer printing, as ageing is completely eliminated from the lacquer process.

GROWTH OF SCREEN PRINTING INDUSTRY

The present tendency in the printing field to print only short yardages of each pattern, has led to a healthy growth of screen printing and has led to the development of new technique in this industry, that has reduced costs appreciably and speeded up production. Continued development along this line may be expected.

REDUCTION OF BOIL-OFF TIME AND CHEMICALS

An important, though regrettable development (?) during the past two years has been the steady drop in the time of boil-off employed by most dyers and the steady reduction in the use of boil-off materials.

The writer has found dyers boiling-off fabric for five minutes only in standing baths that have already been used continuously for two full days without any building up except the constant entry of impurities into the bath by the fabric itself!

During the Fall season, the use of curtailed boil-off procedure causes the production of tremendous yardages of inferior appearing and feeling merchandise. The reason the percentage of inferior merchandise rises in the Fall is twofold—dye plants processing yardages appreciably over their theoretical rating, thus necessitating curtailment of process; and the processing of fabric in the Fall that has aged all summer filled with oils of an oxidizable nature, thus allowing the oils to become more and more difficult to remove from the fabric. Surely it is unreasonable to expect partially oxidized oil to be removed from the fabric in a five to ten minute treatment at the boil in bath containing a very moderate amount of soap and a little stronger alkali.

This curtailment of boil-off time and materials has played its part in encouraging newcomers into the dress goods dyeing and finishing industry by making it very obvious that nominal effort on the part of any newcomer would result in the production of fabric at least as merchantable as the average fabric on the market.

Rayon Staple

F. BONNET*

STAPLE is really not a new development of the rayon industry but one that has rather suddenly come to life. From the earliest days of rayon production the various wastes of spinning and reeling were sold, were usually garnetted, and manufactured into various types of yarn. This was a small side-issue of the industry and in volume quite insignificant. With the steadily growing demand for continuous filament yarn there was little interest in cutting the fibers into short lengths corresponding to those of natural fibers, cotton and wool.

The first introduction of such cut staple on a large scale was brought about by the war when Germany, in particular, being short of cotton began using its rayon mills to furnish fiber lengths which could be handled on regular cotton and wool spinning machinery. During the post-war period semi-dull and then dull yarns were introduced and rayon continued on its phenomenal development and expansion and cut staple was almost forgotten. However, the more recent world depression and the difficulty of European countries to finance purchases of raw materials from abroad, again stimulated the production and development of man-made rayon staple. Germany and Italy have been particularly active in this field in their endeavor to be self contained and have provided liberal subsidies for carrying out the work on a large scale. Japan, with its rapidly developed rayon industry, has also become active in the rayon staple field not so much to be self contained as to capture world markets which this newer fiber opens up. In England, where there has been less economic pressure, important progress has also been made largely with a view to utilizing idle cotton machinery and for the production of new and interesting fabrics both for home and export consumption. In this country the development has been more along the English lines not only of utilizing idle machinery but more particularly along the lines of developing new and novel fabric effects.

Coming into the textile field at this time the rayon staple has had the advantages of all the manifold improvements made in rayon itself. It can be made with varying degrees of luster, filament size and staple length which gives it a wonderfully wide and diversified usefulness in the fabric trade.

The process providing the largest volume of rayon staple is the viscose process and production of the fiber is essentially the same as continuous filament yarns. In fact the yarn is first spun from a regular viscose solution into a thread through jets or spinnerettes with one thousand or more holes. The threads from a number of jets are collected while spinning into a heavy tow which is then cut into the desired staple lengths. Cutting the tow wet gives the filaments a chance to contract and wrinkle which adds greatly to the spinnability of the fibers and strength to the spun yarn. The chemical processes for finishing the cut tow, desulfiding, washing, bleaching, etc., are the same as for continuous filament yarn, except, of course, that the mechanical handling of the fibers is naturally modified. In consequence the fiber strength both dry and wet and the dyeing properties are essentially the same as for continuous filament rayons.

Staple has also been made by the copper-ammonia and acetate process and the latter has added considerably to the variety in fabric design and construction. More recently a staple has been produced in Italy from Casein under the name of Lanital, which being a protein substance, instead of regenerated cellulose, or a cellulose ester allies it perhaps more closely to wool. In fact empirical analyses of Lanital and wool recently published suggest a rather close relationship which seems further borne out in that it takes wool dyes perfectly. Much interest is being shown in this the newest of staple fiber developments.

For cotton spinning the staple usually has fine filaments (1½ denier) and is 1 7/16 inches long. For wool, on the other hand, heavier denier filaments are used (3, 5.5 or 7 denier) and lengths from 2 to 7 inches, these sizes and lengths roughly corresponding to those of the natural staples and for which the ordinary yarn spinning machinery can be used, but owing to the greater uniformity in filament size and lengths of staple the cut fibers are more easily handled than corresponding high grade cotton or wool fibers and are much preferred from the mill standpoint of production to the corresponding natural fibers. Due to this greater regularity of filament size and staple length, for example, less turns per inch are required for the same count which incidentally means higher production and less cost.

The cut staple can, of course, be used alone or blended with silk, cotton or wool. That care must be used in choosing the proper filament size for a given effect when mixed with natural fibers may be illustrated by the following staple mixture with cotton. If, in the blending, the cut staple is of the same size (denier per filament and length) as the natural fiber, a uniform yarn mixture results. If, on the other hand, a fine filament cotton (about 1½ denier per filament) is blended with cut staple, having say a filament size of 3 to 5 denier, then the coarser filaments have a tendency to run to the outside of the yarn. This is particularly noticeable if the cotton has been dyed a dark shade and the cut staple has been left undyed. The blend with the coarser cut staple will have a much more

*The Viscose Co.

wooly appearance than the same blend with the finer filaments. In the same way blends with wool give a great variety of effects depending not only upon the relative proportions of the fibers, but also upon the choice of filament size and length of the staple used.

Rayon staple yarn alone or in blends is used both as warp and as filling. In sizing warps the ordinary sizes for rayon can be used but it is advisable to run the sheet around the roller in the size box so as to get thorough adsorption of the size material and to eliminate entrapped air due to the comparative roughness of the yarn. Filling should be handled in the same way as rayon for best results. Shiner effects do not, of course, show up in the cut staple yarn as in continuous filament yarn.

There has been considerable and perhaps natural resistance to the introduction of the cut staple in this country but the profitable business, especially in prints in the cotton and rayon divisions of many weaving mills making spun rayon fabrics, has gone a long way to overcome it.

The introduction of cut staple into the woolen and worsted trades has been somewhat slower as the trade has been rather feeling its way to find what combination will product the most desirable effects. There is nothing difficult or novel about the processing of cut staple on regular woolen machinery. In fact there are certain and quite definite advantages to be gained in its use as mentioned above and as described in an article by Mr. W. Hardacre, A.T.I. J. Textile Institute, Aug. 1936 issue, page 315. (See also "Worsted-spun Staple" *Textile World,* Oct., 1936, p. 68).

Dyeing of fabrics made wholly of the rayon staple or in combination with the natural fibers is comparatively a simple matter for anyone familiar with the dyeing of wool, silk, cotton and the various rayons. Finishing, however, is another matter and is of vital importance to the success of cut staple fabrics whether alone or in combination with other fibers. Due to the softness and pliability of spun yarns and fabrics produced from them, old finishes have not been found satisfactory. This has been true of combinations with cotton but particularly so of the wool combinations and those resembling wool in the size and length of the staple. The greater softness of the rayon staple fabrics when, for example, the 1½ denier staple is used, while adding to the draping quality tends to give them a poorer hand with less resiliency and greater tendency to crease. Again the cut rayon staple of viscose and copper-ammonia type seem to wet out and spot too readily unless the cloth is given a suitable finish. Some of the newer finishes make the fabrics quite water repellant and spot proof and others give them more or less anti-crush or non-crease properties, but many will not allow such fabrics to be washed or laundered while others will not withstand the solvents of the ordinary dry cleaning process which, of course, make them not wholly satisfactory. The most successful finishes in these two groupings of water repellants and anti-crease seem to have been certain synthetic resins which under the influence of high temperature and a suitable catalyst polymerize to highly insoluble yet pliable substances. Usually such resins and their catalysts are uniformly applied in a water soluble form to the cloth by means of a quetsch after which the cloth is heated to a relatively high temperature to render the resins insoluble, but such treatment must be applied with care for if the fabric be heated to high temperatures in a *dry* atmosphere serious weakening and damage may result. If, on the other and, such heating takes place in a damp or wet atmosphere there is less likelihood that the rayon will be damaged.

Considerable research has already been done both here and abroad on rayon staple itself and in the design of fabrics but this only the beginning. It is not enough to merely use new combinations and develop new designs. The new finishes which are to be applied to many of these new constructions and designs must be such as to give consumer satisfaction. Finishes are being developed which can be "cured" or fixed on the cloth at relatively low temperature, around the boiling point of water, and in a comparatively short time, but the important thing to remember in all such finishing treatments, be they for continuous filament yarn, cut rayon staple or a combination of these with other fibers, is that a suitable damp or wet atmosphere be used. For in the words of Mr. Henry Johnson's effective summary: "Rayon can be stewed but cannot be baked".

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Recent Developments in the

Dyeing and Finishing of Silk

WALTER M. SCOTT, Ph. D.*

AN article on this subject will be, of necessity, quite brief because the silk dyeing industry has been distinguished in recent years chiefly by its lack of progress. This has been due primarily to the lack of incentive for research, because of the fact that there has been a steady decrease in the number of all silk fabrics which require to be dyed.

The statistics for the year ending June 30, 1936, showed a total consumption in the United States of 435,758 bales

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of silk. Of this total it was estimated that 290,000 bales (or 65 per cent) went into hosiery, 85,000 bales or (20 per cent) went into underwear fabrics, and the remainder (or 15 per cent) went into dress goods, neckwear, etc. Even in the latter class it is probable that a substantial proportion of the silk is used in mixed fabrics in combination with other fibers, notably rayon. Furthermore, a fair percentage of the fabrics containing no other fiber but silk are weighted with metallic salts usually of the tin phosphosilicate variety.

Coincidental with these changes in the silk industry have been corresponding changes in the types of dyestuffs commonly used for the dyeing of silk. The straight acid dyes which dye silk in a bath containing sulfuric acid or acetic acid and boil-off liquor have been largely supplanted by neutral-dyeing acid and direct dyestuffs which dye silk in a bath containing a small amount of soap or soluble oil, usually with the addition of Glauber's salt to assist in exhausting the color.

The increased use of direct colors for the dyeing and printing of pure silk fabrics may probably be attributed to several reasons. In the first place, there has been an increasing demand on the part of the public for greater fastness of the colors to washing and the direct colors are more adapted to satisfy this demand than the straight acid colors. Then, too, the direct colors are capable of being completely discharged by hydrosulfite without any danger of the color returning by subsequent oxidation, as is the case with some of the acid colors, particularly those belonging to the triphenylmethane group. The direct colors are also more suitable than the straight acid colors for the dyeing of tin weighted silks as well as mixtures of silk with cotton or rayon.

The dyestuff manufacturers have recognized this trend in silk dyeing, and have assisted it by providing more concentrated and purer direct colors for the purpose of enabling the silk dyer to produce the same bright shades which he had previously thought could only be attained with acid dyes. Several manufacturers had advertised special lines of direct colors with a few neutral-dyeing acid colors which were selected for their ability to dye weighted silks and silk unions.

Very little silk is being dyed with vat dyes at the present time. Only a limited number of this class of dyestuffs have a satisfactory affinity for the silk fiber and, furthermore, because of the mild washing to which colored silks are subjected, there is no need for the extreme fastness to washing which characterizes these vat dyes.

In Germany some recent studies have been made on the application of the Naphthol A S type of developed colors to real silk. However, it is probable that these colors will not make very great headway in the silk dyeing industry in this country, because of the limited range of shades, the difficulties involved in aplying them to silk, and the lack of demand for the greater fastness to washing which they provide.

The dyeing of silk hosiery has received some little attention from recent investigators, but no radical changes in the dyeing procedure have been recommended. In general, the dyeing of silk hose containing cotton heels and toes is carried out practically at the boil in the presence of soluble oil or soap to assist in levelling the shade, and Glauber's salt to exhaust the dyebath.

Probably a majority of the dyers prefer to dye the cotton with direct colors having little or no affinity for the silk and to build up the shade on the silk with neutral dyeing acid colors. It is felt that the chances of obtaining a uniform shade on both the silk and the cotton are better by this method than by the use of direct colors which dye the silk nearly as heavily as the cotton. The difficulty with the latter class of colors is that they dye the silk or the cotton more or less, depending upon the length of time in the dyebath and it is not always possible to match the shade within a definite time limit.

Hosiery is frequently dyed by the one-bath method, i. e., the silk gum (sericin) is removed and the color is applied in the same bath. The major portion of the gum is usually first removed in the boiling solution containing soap or soluble oils and the dye is then added. The dyeing is continued at the boil unless certain neutral dyeing acid colors, such as the Sulfon Cyanine blues and blacks, are to be used for the silk. It has been shown that these dyes tend to react with sericin at the boiling temperature, thereby causing a substantial loss in tinctorial power. Consequently, in such cases it is advisable to keep the dyeing temperature below 205° F. The one-bath method always requires somewhat more dye for the same shade than the two-bath method but the former method is said to give a better "handle" to the goods.

It is claimed that sulfonated oil is more suitable than soap when the one-bath method is used. The advantages claimed for the oil are: (1) better finish and feel, (2) more level dyeing, (3) less likely reduction of dyes, (4) longer runs of batch without harshening effects, (5) more accurate formulas, (6) easier and quicker emulsification of the soaking oils and (7) greater economy. Special boil-off oils have been designed for the purpose of partially degumming the silk up to a point where the desired finish is obtained, thereby making it unnecessary to add finishing materials after dyeing.

The finishing of silks in general and of silk hosiery in particular has been distinguished lately by the increasing use of spot-proof or water-repellent finishes. Such finishes usually consist of metallic soaps, such as those of zinc or aluminum, combined with organic protective colloids, such as waxes, resins, gums, or glues. In the case of hosiery, the requirements of a finish may also include low luster and resistance to snag.

The higher grades of all silk fabrics are finished today, as in the past, with the addition of minimum amounts of finishing materials. Usually only a little sulfonated oil is added for the purpose of giving a softer feel. An exception to this rule is the non-crushable finish which has re-

cently been quite successfully applied to all-silk pile fabrics, such as chiffons. This finish has been obtained by the impregnation of the fibers with a clear, colorless, synthetic resin of the urea-formaldehyde type.

Recent Developments in the

Cotton Bleaching and Finishing Industries

J. ANDREW CLARK*

IN a resume of developments in the cotton bleaching and finishing industry the spectacular and most often over-advertised improvement or process is generally sure to receive more interest and space than is afforded the slow and steady improvement in operations, machine design and application of new and more suitable materials of construction. The necessity for higher speeds and lower costs of operation has been a relentless driving force spurring on both finisher and machine designer to the creation of faster and improved machine design. While the last two years have been marked more by improvements of this latter type, a few new finishes are receiving favorable interest.

The production of rayon surfaces on cotton fabrics, either by submitting the cloth to the chemical treatment of the cuprammonium or viscose reactions has long been the subject of numerous patents. While it is doubtful that a glossy surface with the metallic luster of rayon can be obtained by this method and still retain a fabric appearance and drape, finishes of entirely different and definite characteristics have been obtained. This method actually is not new in that the viscose method had been investigated and used to a limited extent by a couple of large finishing plants all of twenty years ago. Cost and difficulties in control were severe handicaps in its general adoption. One of our large and prominent finishing plants has now been able to successfully control the Furness cuprammonium treatment to produce relatively permanent finishes.

Improvements in bleaching, especially in the chlorine bleaching of cotton within the last two years has been mainly due to improvements in materials and design of equipment. Operations have been speeded up and cloth travels faster. Tenter frames, with ball bearings, are also traveling faster while improved heating units of greater air capacity permit drying at these higher speeds.

At least three companies are now in the field introducing and selling an alkali-soluble cellulose ether for cotton finishing. A tremendous amount of research and patent literature is available on the production of these and many other ethers, which dates back to 1912, and although textile applications were mentioned, the adoption of these is only fairly recent.

Three general classes of ethers are produced, i.e., water soluble, alkali soluble, and organic solvent soluble. Of these, the first two types are of more immediate interest to the finishing industry. The water soluble ethers have been found to have exceptional merit as thickeners in printing pastes. The alkali-soluble type seems to have the most value as a finishing material in that it is capable of producing various finishes without the use of starch, and possess the unique property of withstanding repeated laundering. While it would be slightly misleading to call these finishes absolutely laundry-proof, they do unquestionably retain a large percentage of the original finishing effect after the first laundering. The loss on further laundering is exceedingly small; so small in fact that often after as many as twenty washings an appreciable finish is still retained.

The alkali soluble cellulose ether is soluble in a dilute caustic solution of 6-10 per cent strength to yield thick viscous solutions, which are quite slippery in nature. The ether is precipitated either by water or dilute acids and is accordingly diluted, when necessary, by the use of dilute caustic solution.

The lighter finishes can be applied in the ordinary starch mangle, but owing to the thick and slippery nature of the solution, the heavier finishes necessitate that both bowls be driven to prevent slipping. The various companies suggest different procedures for coagulation at this point. Either half-drying on the long frame followed by an acid treatment or an acid treatment directly after padding may be employed. The goods are then washed free of acid, and finished as usual with the exception that starching is now omitted.

The exceptional resistance of this substance to boiling caustic permits an unusual application. Grey goods may be padded and boiled in the kier in the ordinary manner. The dilute caustic of the kier charge serving to coagulate or precipitate the ether since it is below the minimum concentration required to keep the ether soluble. This application would seem to offer economies in caustic employed in the kier, while simultaneously giving the grey goods a very good alkali pre-treatment. In addition no extra operations are required.

Incorporation of mineral fillers is possible to a greater extent than is the case with starch while an additional advantage of permanency is obtained.

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Of secondary importance is the ability of cloth finished with these agents to resist staining while in addition shrinkage after laundering is much less than when finished with the orthodox materials.

In leaving the subject it will be of interest to speculate whether the same methods of advertising to create consumer education and demand will produce the spectacular success that the sanforizing treatment attained.

It would be impossible to touch on all of the improvements offered by the textile machinery manufacturers, since many of them consist in the installation of roller or ball bearings, change in materials of construction, etc., with little or no basic change in design.

Tenter clips have received their share of attention. As every finisher knows, the greatest wear on the plate occurs from the dropping of the gate after release of the cloth, while at the same time the insert of the gate is dulled. Clips are now available which by remaining open on their return greatly prolong the life of the plate and insert. Pressure lubrication of the rivets is offered to prevent the danger of excessive wear at this point, which often occurs with chains of the older types. An ingenious method of design has enabled the manufacturer to introduce a rivetless plate in the tenter clip construction, whereby a substantial saving is claimed over the cost of the riveted construction.

Another of the better known manufacturers is about to introduce a sueding machine, embracing a new principle of action, and is to be fully protected by basic patents. Details are as yet not available for publication.

In line with the general speeding up of equipment, a new high speed singer is being offered to the trade at a rated top speed of 300 yds. per minute, with two latest type kemp burners.

Drying speeds on the long frames have been gradually increased with improved design in blower and air circulation systems. One heating concern reports considerable success with an entirely new principle, employing the introduction of small amounts of steam to the circulation system to maintain a definite vapor tension within the frame housing.

The Department of Commerce, through the National Bureau of Standards held a conference June 22, 1935, on the Testing and Reporting of Woven Dress Fabrics, which was attended by representatives of the various finishing plants, retail and dyers and cleaners associations, and testing laboratories. Unfortunately, no representatives of the converters seemed to be present. It was nevertheless a step forward in trade relations and resulted in creating a standard method of testing these fabrics, published as "Recommended Commercial Standard for Testing and Reporting Woven Dress Fabrics"—T.S-2143. Inasmuch as the converters appeal to the commercial testing laboratories in controversies, a uniform method of testing is of a decided advantage of all concerned.

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Recent Trends in

Textile Microscopy

JOHN H. SKINKLE*

THE trend of textile microscopy the last two years has been one of steady infiltration of apparatus and methods into the industry. From 1930 to 1934, progress in the use of the microscope and its accessories was very rapid, and at first sight, one would think that it had recently slowed down. Insofar as this applies to the discovery of new methods or apparatus this is true, but if we apply it to the general growth of microscopic technique it is not true. An investigation of the laboratories and even the plant offices show a steadily increasing number of microscopes in active use and a constantly mounting list of purposes for which it is being used. The fact is, that new methods and accessories were coming out so rapidly and men capable of using these were being trained so slowly that the industry was unable to assimilate the mass and to some extent resisted it.

The first resting place came with the publication of books by Preston[1] and Schwarz[2] which for the first time brought together the mass of methods and combined them with enough explanation as to make it possible for a fairly skilled man to apply them to operating conditions. By this time, also, the textile colleges and the various textile professional societies had educated many men in the technique as well as the possibilities of the microscope. Finally, it had been demonstrated many times to the industry that the microscope could do many things in the way of identification, location of causes of damage, and discovery of inherent properties of textiles that could be found out in no other way.

The progress in techniques and the applications of the techniques has been principally along three lines: cross-sectioning, polarized light, and quantitative measurements. In nearly every case there is no new principle involved, no new discovery made; simply an application of what had previously been considered of only academic value.

Cross-sectioning has always been the bête noir of what we may call the "occasional microscopist"—the man who

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is not steadily engaged in the use of the microscope, but who uses it only occasionally and in conjunction with other work. It has been possible for a long while to obtain cross-sections of rayons, good enough for identification, by means of the sectioning plate; but this method was not applicable to other fibers or to dyed fibers. The microtome, on the other hand, was expensive and required much practice and acquired skill to use successfully, as well as requiring quite a long space of time to complete the preparation of the sections. Recently there has been announced by Hardy[3] a fairly simple device which is essentially a modification of the sectioning plate but provides for precise cutting of sections of definite thickness and the examination of the sections separate from the plate. This device gives quick and satisfactory sections of dyed fibers and of any kind of fibers, even cotton. Schwarz[4] has also announced a similar apparatus.

In the application of polarized light, Schwarz and Hotte[5] have shown that it is possible to obtain a numerical estimate of the number of immature fibers in a sample of cotton. The test requires special apparatus and some degree of skill on the part of the operator. Morey[6] used polarized light in his investigations on the dichroism of dyed fibers and also in correlating the orientation and physical properties of cottons and rayons. This is primarily fundamental research in nature but has some important industrial applications to the thoughtful reader.

Von Bergen[7] and others have applied quantitative measurements of fiber diameter to the determination of wool quality with considerable success. It is unfortunate, however, that in order to shorten the time required for a determination, the apparatus was made complicated and expensive. One would think that it would have been better to retain the simplicity of the disc micrometer and the ordinary microscope even if the time required was somewhat greater. The author has recently published a method for positively distinguishing wool and mohair by scale length measurement.[10]

A comprehensive microanalysis of the textile fibers has been carried out by Osborne[8], a study of whose reports will reveal many refinements and additions in technique. The application of the cast method of Hardy[9], for studying the scales of hairs, to the study of the surface fissures of the bast fibers is an interesting example of how methods devised for one purpose may be adapted to others and illustrates the statement made at the beginning of this article: that progress in textile microscopy the past few years has been in the application of old methods to new discoveries and to industrial use, rather than in the field of new discoveries and inventions.

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Felt Advances

with Chemical Developments

THE pressed felt industry during the past year has made definite progress as a representative member of the textile industry, to further new uses for its products through many developments in finishing processes.

Felt probably has more diversified uses than any single member of the textile family. Inasmuch as so many industries (of which may be included the automotive, athletic goods, toy and novelty, shoe, piano, radio, surgical, railroad and transportation to name a few) have found places where felt may be utilized, it still remains the felt manufacturer's problem to protect these applications from competitive products. Improved methods of construction and dyeing as well as new types of finishes and adjunct materials tied in with felt have been the most potent weapons of the felt manufacturer.

Dyed felts have varied requirements as to color fastness, these specifications ranging from the fugitiveness of basic dyes to the stringent fastness requirements as exemplified by the fastest chrome colors. Many developments have been made in the past year in improving the fastness properties of dyed felts for athletic goods wear as well as for felts used as decoratives for bathing suits. In order to obtain the proper fastness to washing, light, perspiration and salt water, chrome colors have been employed in the duller shades, while the brighter colors have been improved with milling colors. Adherence to these classes of colors is necessitated, especially for decorative window display felts where exposure to direct sunlight must be encountered over a period of many months.

Lower grade felts which do not withstand long running in the dye kettles have always been a problem to the felt dyer. Analogous to the early problems of the rayon dyer, a boon to level dyeing of low grade felts has been the selection of the more colloidal union colors.

Being a fabric in which wool is predominant there re-

mains the everlasting hazard of felt being subject to moth damage. The recent development of the more permanent moth proofing compounds, has opened fields which could not have been approached formerly because of possibilities of moth damage. This has been especially so in the use of felt for pianos and organs, as well as around furniture.

Through advances made in combating the growth of mold, felt has found an excellent outlet in the refrigeration industry, where it is called upon to withstand abnormal conditions of humidity.

Felt has numerous applications where it must show good water resistance. Due to its more porous structure felt has been found to be more difficult to waterproof effectively than a woven textile. The most efficient waterproofings developed for felt may be divided into three classes—

(1) those which are dispersed in water, (2) those which are capable of being melted and applied hot and (3) those which are carried by an organic solvent. Each has its definite application depending upon the finish required.

With the advent of rubber latex, the felt industry was given a new tool with which to approach new fields. One disadvantage of lower grades of felts had been in the loss of fibers from their surfaces when subjected to vibration. These linted fibers if used next to fine mechanism would tend to cause clogging of the latter. By coating these surfaces with a continuous flexible film of latex, this disadvantage has been overcome.

Rubber latex has found advantageous applications in lending proper flexibility to sizing mixtures, besides improving their water resistence. Felt has been found to be a good strengthening agent for rubber. This property has been the basis of the development of new gasketings in which felt is employed as a base for rubber compounds, wherein far greater tensile strengths are attained over rubber compounds alone. The rubber is compounded to obtain a maximum of oil resistance as may be attained with rubber. Should a gasketing made with rubber plus felt commence to disintegrate because of the ageing of the rubber, there remains present the reinforcing felt to add further life to the gasket.

Rubber latex, in turn, acts as an excellent medium, usually as a coating by which strength may be added to felt. The resiliency and body of a felt may also be improved by subjecting it to a latex immersion and drying.

The introduction of the newer synthetic compounds has allowed the felt industry to move forward with these new developments. In this group may be included the synthetic rubbers, the synthetic resins, and to some extent, the regenerated celluloses.

One of the major outlets for felt is in the automotive and mechanical industries. It is used here for three main purposes, (1) for oil retention and as a dust guard, (2) to check the passage of oil and (3) for padding and insulation. Tremendous poundage of felt had been consumed in previous years as washers to prevent oil leakages in automobiles. The introduction of leather sealing mediums which possessed greater efficiency pushed felt aside in many instances with a consequent loss of business. The development of the synthetic rubbers with their excellent oil resistance offered the felt industry a new adjunct with which to regain its lost trade. After months of research the felt industry now offers a new oil sealing medium which is not only applicable in the automotive industry but also in any industry where the passage of oil from one part of a shaft or mechanism to another must be checked.

The two most extensively developed synthetic rubbers made available to the felt industry are Duprene* and Thiokol**. The former is a derivative of monovinyl acetylene while the latter is produced by the inter action between ethylene dichloride and sodium polysulfide. By superimposing layers of felt and the synthetic rubbers, it was possible to obtain a washer material which would tend to seal the passage of oil.

Synthetic resins offered possibilities to the felt industry especially when these become available as being dispersible in aqueous solutions. These resins may be generally grouped as (1) thermo setting and (2) thermo plastic. The thermo setting such as the urea formaldehyde and phenol formaldehyde resins have not been as applicable as the second group inasmuch as they produce finishes which are usually hard and lacking in resilience. The thermo plastic resins with some modification have found use when impregnated in felt as a gasketing material, applicable where unusual chemical resistance is desired.

Thiokol, which is generally viewed in the class of synthetic rubbers has properties in certain forms which make it analogous to a synthetic resin. In powder form, if spread upon a felt surface and subjected to heat, it will become plastic with the result that upon cooling, a smooth continuous film is produced which is highly resistant to oil and solvents.

Regenerated cellulose as such or in a compounded form has been used effectively for producing a finish on felt which is appealing to the eye as well as one which is waterproof and capable of being cleansed. This development has opened up possibilities for felt in the transportation and automotive fields as an insulating material which does not require a decorative facing.

The marketing of synthetic compounds possessing very low surface tensions when dispersed in water, has made available felt moistening pads to the textile industry which are capable of greater moisture absorption than had been attained heretofore.

The felt manufacturer has attempted to aid merchandisers of millinery products by the incorporation of deodorants in finishing baths, as a phsychological appeal to feminine buyers.

Very definite and progressive steps have been taken by the felt industry in the past months to better dyeing and finishing operations in order to hold present markets as well as open up new outlets for its products.

*Manufactured by DuPont Co.
**Manufactured by Thiokol Corp.

Review of Recent Progress in

Microbiology of Textiles

WM. G. CHACE*

IN reviewing the progress of research in textile microbiology for the past few years, one is impressed by a notable change in the method of attack on the problem. Recent work seems at last to be generally directed along lines of basic research rather than technical improvement.

The research associations of the various branches of the textile industry in England, The Shirley Institute and The British Research Association for the Woolen and Worsted Industries, were the first to realize the importance of this type of research. Their efforts appeared in the works of Burgess; Bright; Bright, Morris and Summers; Galloway; and others, several years ago.

Following the lead of the English, it seems that workers in general have begun to attack the problem from the theoretical side. This is a very encouraging sign. We cannot successfully solve any problem until we know definitely what the problem is.

COTTON

The British tradition has been carried on in the work of Galloway[1]. This excellent study of moisture relations of mold and textiles definitely clears up several disputed points.

First—It points out that for air dry materials, relative humidity of surrounding atmosphere and not percentage regain of material is the determining factor in controlling mildew formation.

Second—Deliquescent substances are not responsible for increased mold growth because they attract moisture as is usually reported. Any increase in mold growth is due to stimulating action of the substance itself, and is equal for similar substances not deliquescent.

Third—A determination of minimum moisture requirements for several representative mold types showed these to be between 75 per cent and 95 per cent relative humidity. The lower figures are for aspergillus types.

Foremost in this new trend in this country is the work of Prindle[2] on both cotton and wool. He has made a very careful study of the microflora of both these fibers.

His study of the microbiology of cotton has not been startling as it has disclosed the presence of types of organisms already reported. The fact that he has found many of his bacilli unlike any named species is interesting and stimulating to new work in this field. His announcement that all types isolated caused serious staining of cotton but that few produced tendering is in line with previously published results.

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WOOL

Prindle's[2] work on wool, however, is productive of more notable results. Here he found six types of mold not previously reported on wool. All of these types were capable of attacking proteins and hence possibly wool. Two of these previously unreported types, Alterneria and Stemphylium, were found on the majority of samples. This work would seem to be a decided advance in the knowledge of the microbiology of wool and indicates that our previous indifference to molds on animal fibers was not justified.

The reported action of bacilli on wool is in line with the work of others.

FLAX

Work of basic importance in the retting of flax is reported by Makrinov[3]. He conducted pure culture rettings and found a pure culture of Pectinobacter amylophylum to produce retting superior to the usual methods.

Cerighelli[4] also conducted experiments on flax retting and found the microbiological retting superior to physical and chemical methods.

Another work on flax is that of Carbone and Moggi[5] who found that retting is retarded by the presence in the retting bath of certain heavy metals. This is particularly noticeable in the case of iron, copper, and lead which affect seriously the color of the final product.

If preliminary reports of successful growth of fiber flax in this country are confirmed, by general success, these results may mean much to the coming linen industry in this country.

DESIZING

Evans[6] proposes bacterial methods of desizing. He gives as his reasons the wide temperature and pH range of bacterial enzymes as compared with those usually employed. Such methods have been proposed before but have not met with general favor in the industry.

Rordorf[7] points out that growth of lactic acid bacteria in enzyme solutions used for desizing is detrimental as it produces an acid condition unfavorable to enzyme action. In another article[8] he claims this may be prevented by use of Viveral S which keeps the reaction of the desizing bath at pH 6.6 to 6.8.

MILDEW PROOFING

Armand[9] investigated the action of various classes of dyes on mildew growth on wool and concluded that an antiseptic dye does not exist. Treatment with chrome, as previously reported, had an inhibitory result, but Armand concludes that this is due not to toxic effects, but to removal of degradation products which favor mildew growth.

Dyeing with vat colors, due to alkalinity, increases degradation and favors mildewing.

The I. G. Farbenindustrie, however, obtained a patent[10] on a rotproofing series of dyes containing two NO_2 groups They are designed for use on industrial cellulose fabrics like sacks, sails. etc.

Funch-Hellet[11] investigated oil of thyme as a disinfectant and found it particularly valuable on carpets, especially when mixed with turpentine and rosin oil.

A tertiary alkylphenol sold as "Abracide" is discussed in an article in the Textile Recorder[12].

Patents were obtained on the following types of compounds as mildewproofing agent: "certain high molecular weight aliphatic alcohols, aldehydes, and esters"[13]; "thiuram sulfide for protection of wool and cotton"[14]; "various nondyeing thiazols for protecting wool"[15]. Since no record of results obtained with these compounds is available, experience will be necessary before it is possible to judge of their effectiveness.

Research of interest to users of organic antiseptics was carried out by Galloway[16] on the effect of oils, fats, waxes, etc. on antiseptics. A mathematical relation between partition coefficient of antiseptic in oil and water and its antiseptic properties in the presence of oil is found. Since most organic antiseptics are less soluble in water, they are less active in the presence of oil. This would be a matter for consideration where the oil, as often happens, was a contributing cause to the ease of mildewing, and the antiseptic was used to correct it.

In investigating the growth of molds under pressure, May, Herrick, Moyer, and Wells[17] found molds grew better under increased atmospheric pressure. The optimum point was around three atmospheres.

The opposite effect was noted by Thaysen[18] when bacteria were cultured under pressures of 10 atmospheres. This work on bacilli and cocci showed growth of both types greatly retarded. At slightly elevated temperatures all vegetative cells were killed.

These results may have some bearing on the proposed methods of storage in gases other than air, e.g., CO_2 as proposed by Galloway[19] and further investigated by Skovholdt and Bailey[20].

TESTING

One of the most significant advances is the Thom[21] method for testing mildew resistance. The method is thorough, simple, and relatively quick. The authors propose that a definite organism, Cheatomium globosum, be chosen as a test culture and planted on the samples to be tested. The infected samples are then grown on a non-nutrient agar containing inorganic salts.

The conditions of the test and the scientific set up make this test by far the best yet proposed. It might well be adopted as a "Standard Method" of testing mildew proofing.

The suggestion of Burgess[22] that destruction by the enzyme trypsin be used as a test for mildew resistance of wool fabrics seems to need more experiment to see whether toxicity will affect both enzyme and microorganisms alike. In the cases noted, as pointed out by Burgess[23], differences were relative to proteolytic action, not to fungicidal effects.

CONCLUSION

In conclusion it might be said, then, that the work of the last few years has—

First—Increased our knowledge of some physical conditions controlling mildewing of cotton.

Second—Extended our knowledge of the types of organisms causing damage to wool and drawn our attention to the part played by molds in damaging wool.

Third—Proposed improved methods for the biological retting of bast fibers.

Fourth—Investigated physical conditions affecting use of antiseptics.

Fifth—Worked out an excellent test for mildew resistance of cotton fabrics.

This very brief article is in no way to be construed as a complete survey of the literature of textile microbiology for any period of years. It is, on the other hand, an attempt to "hit the high spots" and indicate the trend in modern research.

The bibliography is not complete. Much excellent work confirming previous results and several articles of minor importance have been purposely omitted.

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Papers presented before the Annual Meeting and stenographic reports of the discussion will appear in future issues of the Reporter.

One Year of
Textile Processing in England

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IN this review of the more interesting features of England's textile industry during the past year attention will be directed more particularly to the dyeing and finishing of woven and knitted materials. Yarn processing has an importance of its own but it is difficult to point to any outstanding development in this section of the textile industry.

Perhaps one of the most noticeable features of the piece goods trade is the persistent effort which is being made to popularize fabrics and garments which can be guaranteed not to shrink during washing. At first this was slow "to catch on", but now many finishers have commenced to produce unshrinkable fabrics. The Bradford Dyers Association Ltd., one of the largest combines of dyers and finishers in England have devised a plant of their own for making fabrics unshrinkable (their finish is being marketed under the mark of RIGMEL) but other finishers appear to be using the "Sanforizing" finishing plant as originally introduced in America with considerable success. This type of plant is being made in England under license from the patentees. The unshrinkable finish is very largely used for cotton poplin fabric having colored stripes such as is now almost universally used for men's shirts.

It may be remembered that some four years ago Messrs. Tootal Broadhurst Lee & Co. Ltd. of Manchester first introduced crease-resisting cotton and rayon materials. The resistance to creasing was obtained by forming a suitable synthetic resin within the fabric. An extension of this process to include linen goods has been delayed until more recently owing to the unforeseen discovery that when a synthetic resin is similarly applied to linen it reduces considerably the durability of this fiber. The problem of how to avoid this adverse effect has been overcome in a simple manner and now crease-resisting linen is being marketed with complete success. Actually the linen is given excellent durability by submitting it to a shrinking process (treatment with caustic soda solutions is employed) after application of the resin. This is somewhat reminiscent of the shrinking treatment which was found necessary with Lilienfeld's super high strength viscose rayon which raised such high hopes but which were not realized some few years ago.

While the use of synthetic resins (urea formaldehyde resins are usually employed because of their white color) in textiles for conferring on them anti-crease properties is now being more and more widely adopted, it is significant that yet further uses for these substances have been discovered during the past year. It appears that the use of synthetic resins will open up a number of new treatments for various textile materials. Thus it has been discovered that the presence of a urea (or urea derivative) formaldehyde resin in cotton or viscose rayon gives it a basicity so that it can be dyed with acid dyes which normally are applied only to wool or silk. Some of these dyes are brighter in tone than direct cotton dyes and so it is possible to secure by direct dyeing (with acid dyes) shades considerably brighter than those hitherto possible. Another use for synthetic resins is that of applying them to cotton goods dyed with direct dyes in the usual manner for the purpose of making the shades faster to washing. In this connection it must be remembered that a synthetic resin can affect the light fastness of a direct dye adversely so that progress along these lines is as yet somewhat slow.

Synthetic resins have also found an application in finishing. When incorporated in starch filling pastes such as are commonly used for stiffening cotton materials, they have the effect of fastening the starch granules within the fabric so that the stiffness is retained even after several washings. Usually the synthetic resin added to the starch is in an intermediate water-soluble stage and the finished fabric must thereafter be heated to at least 100° C. for two or three minutes in order to transform the resin into its insoluble form.

For many years it has been a recognized disadvantage of calender and schreiner finishes on cotton fabrics that they are not fast to washing. When the fabric comes in contact with water, each fiber swells and so distorts the flattening applied to it in the finishing process. Finishers have now found that if a synthetic resin is incorporated in the fabric immediately before such calendering treatment the finish is thereby made substantially permanent.

Yet one other development in the use of synthetic resins in textile treatment is that of producing permanently crinkled fibers or yarns by insolubilizing within them a synthetic resin at a stage in which they are crinkled while passing between fluted rollers. Such fibers are now being used in the manufacture of pile fabrics, but it would seem that in the near future such artificially deformed fibers may be employed in the manufacture of specially strong yarns—the crimps will have the effect of binding the fibers together so that they slide over each other less easily.

Quite an important development during the past year is the much more extensive utilization of viscose staple fiber for all kinds of woven and knitted materials. In England, Messrs. Courtaulds, Ltd. have taken a great deal of trouble to demonstrate the easy adaptability of existing spinning machinery so as to deal satisfactorily with Fibro (Courtaulds viscose staple fiber). Large quantities of fabric are being made entirely from Fibro yarns or yarns containing Fibro in admixture with other fibers, especially cotton. It is believed that the cotton section of the trade is using viscose staple fiber to a much greater extent than

the wool section, but probably this state of affairs will not persist for long since there are definite advantages to be obtained by mixing wool and viscose staple fiber. Wool yarns having a proportion of viscose staple fiber have an added luster which is attractive, while the mixing of the two fibers makes the yarn cheaper to produce. Unfortunately viscose staple fiber is not warm to handle and in mixture with wool it takes away something of the heat retaining properties of the all-wool material.

For woven fabrics. viscose staple fiber has proved very useful since it gives a fabric which is soft, full in handle, and capable of draping well. Such fabrics are of good durability but it is essential in the dyeing and finishing that the surface of the fabric is not left hairy. As a matter of fact, all 100 per cent viscose staple fiber fabrics tend to develop a hairy surface and because of this they readily get dirty in wear. The finishing processes applied to such fabrics should therefore include a very close singeing and after this the fabric should be as subject to as little surface friction as possible.

Viscose staple fiber yarns are likely to prove particularly useful for knitted fabrics which are to be brushed or raised on one side for the purpose of giving the fabric a fuller handle and a warmer touch. This is because fabrics made from viscose staple fiber respond more readily to the brushing process than similar fabric made from ordinary viscose rayon yarns having continuous filaments. In brushing, the fibers are snatched out of the fabric surface and it is obvious that this can result more easily if the fibers are short rather than long. Viscose staple fiber fabrics whose surface has been made hairy by brushing wash quite satisfactorily and it would seem that such fabrics will prove particularly useful for winter qualities of ladies underwear.

As textile auxiliaries, quite a large number of new compounds have made their appearance. Many of these have a complex organic composition and they indicate how intense is the search for substances which can assist the dyer and finisher.

Recently, compounds of the Fixanol (I.C.I.) type have proved very useful to the dyer of cotton-wool mixture materials and also of cotton goods in so far as a treatment of the cotton dyed with direct dyes is thereby made faster to washing or to cross dyeing. It is claimed that this simple treatment so fastens the dye that there is little or no tendency for the color to bleed when the dyed material is wetted and thus it is possible to avoid difficulties which the dyer frequently meets in this direction. Fixanol is just one example of the newer complex organic compounds just mentioned. It is quaternary ammonium compound having a pyridine basis.

Special high valent sulfur and phosphorus organic compounds have also been introduced to facilitate the dyeing of cotton with vat dyes. It seems that the cotton can be given an increased affinity for these dyes if first impregnated with the complex sulfur and phosphorus compounds. Thus indigo can be applied to cotton in one dip so as to secure as good a depth of shade as when several dips are employed in the usual way.

These complex substances have also found a special use in the stripping of azoic and vat dyes from dyed materials. By means of such products the dye within the dyed material is finely dispersed and thus made readily attacked by reducing agents for it to be removable from the fiber by washing.

Betaine products have also been introduced for use in vat dye printing wastes, their presence assists the production of deeper shades having increased fastness properties.

Turning now to hosiery goods, at least two developments should be noted as being definite stages in finishing progress. The first is concerned with knitted fabric and the second with rayon and pure silk hose.

Hitherto, knitted fabric has been mainly dyed and finished in tubular form; it is very convenient to deal with fabric in this condition and flat-knitted fabrics have therefore been seamed at their selvedges into tubular form before wet processing and the seaming thread withdrawn after dyeing and finishing. But during the past year many improvements have been made in tenters so that now it is better in many cases to finish the fabric on a tenter instead of by the tubular method.

The more successful tenters for knitted fabric have been imported from the Continent and they are provided with two essential devices which enables them to deal satisfactorily with knitted fabric in the flat (open-width) form. Firstly there is provided at the entry end of the tenter a device for taking out the curl from the selvedge of the fabric; this is most important since all knitted fabric selvedges curl up tightly when the fabric is pulled in length. Secondly, a device is attached so that the fabric can be fed into the tenter machine at any desired rate independent of the rate at which the tenter chains carry the fabric forward.

The tenter chains are provided with pin plates instead of the more usual clips since the latter are quite unsatisfactory with knitted fabrics.

It is evident that with tenters of this type it is possible to finish knitted fabric so that it weighs a definite amount per yard (the adjustable feeding device ensures this) and this is a most important consideration. It is much more difficult to finish fabrics to this exactness on the tubular drying and finishing machines.

After finishing on a tenter, knitted fabric has a somewhat firmer finish than when finished on alternative machines. This is because the fabric is dried from a wet state while under stretching forces (to secure the required width and length). To avoid this firmness it is desirable to use air in the drying chamber at a comparatively low temperature and so avoid "baking" the fabric.

By means of these new finishing tenters it has been possible to reduce finishing costs considerably and this is one of the reasons why the tenters have come into such prominence. But incidentally, a tenter finish gives a knitted fabric much cleaner selvedges with a greater uniformity in width.

New finishing machinery has also come more widely into use during the past year for hose. It has been found that a superior finish can be obtained by drying hose (drawn over metal forms) with the aid of hot air rather than by the old fashioned press method. In the press method the hose are drawn on wooden or metal forms which are then pressed in a two- or three-bed steam press. This results in a slightly glazed finish while the threads in the hose are definitely fixed in their positions they occupy before pressing. In the new machines, the hose are similarly drawn over metal forms but in the subsequent drying (while being led through a hot air chamber) the threads can adjust themselves to the new tensions set up and there thus results hose in which these threads are more evenly spaced. Furthermore, drying in hot air free from any pressure enables a somewhat dull appearance free from glaze to be obtained. English finishes are adopting these hose finishing machines to a considerable extent and are actually obtaining higher prices for hose thus finished.

It should perhaps be noted that there are two distinct types of these new hose finishing machines. In one, the hose are placed over metal forms which then pass between damping rollers and then float through a drying chamber on numerous rotating horizontal rollers. In the other type of machine, the metal forms are attached vertically to an endless chain which carries them through the damping and drying chambers. There is active competition between the makers of these two types of machine and it has yet to be seen which is the better; there are advantages and disadvantages attached to each, but both types yield a finish which is superior to the old press finish.

In connection with the processing of wool materials it is interesting to note that a large amount of research has been devoted to the fine structure of wool fibers, notably by Speakman, Astbury, and others, and that some of this is beginning to influence industrial treatments commonly applied to wool. It is now being recognized much more clearly than hitherto how much the properties of wool are linked with the pH conditions surrounding it. This is particularly important in connection with dyeing and finishing processes. For example, the setting of wool in crabbing and similar processes is facilitated by a pH of about 9.2, and in dyeing with acid dyes a first combination of the wool with the mineral acid present in the dyebath is found to have a profound influence on the subsequent absorption of dye.

Increasing attention is being given to the production of wool materials which have been treated so that they resist felting during washing and thus are substantially unshrinkable. Practically all such unshrinkable wool goods are produced by the old chlorination process in which the wool is treated with an acidified solution of sodium hypochlorite. The gaseous chlorine process is still being developed by the Wool Industries Research Association and so far it does not appear to have been applied on a wide scale. It seems that free chlorine whether applied in the form of acidified hypochlorite or as a gas has an impoverishing action on wool, and for this reason unshrinkable wool materials as hitherto produced have inferior wearing properties. It is believed that an entirely new process for making wool unshrinkable has been evolved and is about to be introduced in which chlorine is not used, and in this case there is the possibility that a more durable unshrinkable wool will result.

In the bleaching of wool with hydrogen peroxide a recent important discovery is that considerable economy is obtained by the addition of sodium metaphosphate to the bleach liquor. Hitherto, sodium pyrophosphate and sodium silicate have been used but it is claimed that by use of the metaphosphate excellent bleaching with a much lower consumption of hydrogen peroxide can be obtained.

In spite of the manufacture of large quantities of rayon of a matt type, dyers and finishers in England are still called upon to dull finish bright rayon materials. This applies to both woven and knitted goods, and especially to hose made from rayon and pure silk. The barium sulfate method is being used for hose when an especially permanent and good appearance is desired, and in this the hose are first treated with barium hydroxide and then with Glaubers salt so that barium sulfate is precipitated within the individual fibers of the hose. For woven and knitted rayon fabric the more important dulling method now in use is that of impregnating the fabric with a suspension of an opaque pigment such as titanium dioxide. Products of this type have been so much improved during the past year that they have a moderate affinity for the rayon and can be applied from warm dilute liquors in much the same manner as direct dyes.

During the past year Bemberg rayon (rayon made by the cuprammonium process) has come more into favor. This type of rayon consists of very fine filaments (1.3 denier) and the yarn is usually supplied almost free from twist. It has excellent softness and a silky luster. But hitherto some difficulty has been experienced in knitting it. Knitters have solved these difficulties and some very pleasing Bemberg rayon fabrics are now being produced. It is an advantage of this type of rayon that it lends itself excellently to the brushing treatment mentioned earlier in this article. Bemberg rayon knitted fabrics are now being brushed to give very soft downy materials.

It will be remembered rayon is made by a process which involves stretching of the filaments. While this gives them increased fineness it also affects (reduces) their dyeing properties, and it is obvious that unless the stretching is exactly standardized, succeeding batches of the rayon will differ slightly as regards their dyeing affinity. It is believed that this standardization has not yet been perfected since, in knitted goods particularly, the dyer finds it difficult to avoid so-called "liney" colors. This defect appears to be due to the presence in the fabric of threads having a higher affinity for direct dyes than the surrounding threads. To assist the avoidance of this defect lists of dyes which least reveal these dyeing differences have been published and they are now obtainable from most dyemakers.

Alphabetical List of

NEW PRODUCTS FOR TEXTILE WET PROCESSING

DEVELOPED DURING THE PAST YEAR

DYESTUFFS
TEXTILE CHEMICAL SPECIALTIES
EQUIPMENT

Alphabetical List of

MANUFACTURERS

SUPPLYING THESE PRODUCTS

WITH the cooperation of the manufacturers of dyestuffs, textile chemical specialties and wet processing and laboratory equipment we have prepared the following list of products which it is understood have been placed on the market or developed in the past year. The list of products has been subdivided according to the classification given above and the individual products are listed in alphabetical order. The names of the manufacturers, in an abbreviated form, appear in capital letters immediately following the name of the product. In many cases the abbreviated name of the manufacturer will immediately indicate to the reader the full name of the company. However, supplementing and appearing at the end of the alphabetical list of products, we have listed alphabetically the key name of all the manufacturers whose products are mentioned, together with the complete firm name and address.

We have tried to make this list as complete as possible but there may be some unintentional omissions. The properties claimed for the products are claims of the manufacturers. We have depended upon the manufacturers to supply us with a complete list of their new products together with information concerning them. It must be understood, in this connection, that the information we have published is necessarily in a brief form inasmuch as lack of space prohibits the publication of complete details concerning any product. We hope, however, that the information that appears is sufficiently comprehensive to give the reader a specific idea of the intended uses and properties of the product. For those products in which you have a particular interest, we would suggest that you write, either directly to the AMERICAN DYESTUFF REPORTER or to the manufacturer for further details.

Dyestuffs

A

Acetamine Brown G D; Acetamine Brown S R; Acetamine Dark Brown S; Acetamine Orange P R; Acetamine Red R P Powder; Acetamine Rubine B; Acetamine Scarlet B; Acetamine Yellow C G; Acetamine Yellow 5 G (Patented): **Celanthrene Fast Violet B L; Celanthrene Navy Blue B P Concentrated** (Patented) — (DUPONT, DYESTUFFS DIVISION)—specifically intended for application on acetate fibers. They are said to disperse very readily, penetrate well and to be level dyeing, which contribute to their excellent dyeing properties. Some of the group are of interest for discharge printing.

Acid Alizarine Black RA — (GENERAL)—a new chrome black manufactured by General Aniline Works and offered to the trade by General Dyestuff Corp. It is said to be one of the few chrome blacks which can be dyed satisfactorily direct from a Glauber's salt-sulfuric acid bath. It produces a bright, bluish black, closely approaching logwood blacks. It is especially recommended by the manufacturers for dyeing piece goods, cotton and rayon effects being left perfectly clear. It is stated that it may also be used for dyeing loose material and yarn which has to stand only a moderate fulling.

Acid Light Scarlet G L—(SANDOZ)—a bright shade of acid scarlet, said to have very good fastness to light, salt water, stoving, rubbing and acid milling. It is recommended by the manufacturers for dyeing raw wool, worsted top, and piece goods for the manufacture of blankets and bathing suits. Because of its fastness to acid milling it is further recommended for dyeing raw fur mixture hats producing a bright scarlet with an acid milling fastness heretofore said to be only obtainable with chrome colors.

Acid Light Yellow P—(SANDOZ)—an acid dyestuff for use on loose fur mixture hats said to have very good fastness to light and acid milling. This dyestuff in combination with Acid Light Blue G and Acid Light Scarlet G L make possible a variety of shades on loose fur said to possess very good light fastness and fastness to acid milling otherwise obtainable only through the use of chrome colors. The elimination of chrome as is possible in the application of the above mentioned colors is said to leave the fur in much better condition for the subsequent shrinking operations.

Acid Violet R N L—(YOUNG)—this product is recommended by the manufacturers for the dyeing of wool or silk by either acid or chrome methods; it is said to be of excellent fastness to light and fulling.

Algosol Brown IBR—(GENERAL)—produces brown shades said to be of excellent fastness to light, washing and chlorine. It can be used both for dyeing and printing purposes. Its chief advantage is said to be its excellent solubility, which is far superior to the solubility of Algosol Brown IRRD. It is also claimed that it has very good fastness to hot pressing and that it hardly changes shade under artificial light.

Algosol Olive Green I B — (GENERAL)—a new addition to the range of water soluble vat dyestuffs producing bluish green shades said to be of excellent fastness to light, washing and chlorine either printed or dyed.

Altocyl Colors—(ALTHOUSE) — a new line of acetate colors said to be especially adapted for the production of various color effect dyeings. These colors are said to only slightly stain cotton, rayon and silk, thereby giving brighter shades on the acetate. These colors are further said to stand hydrosulfite and chlorine which, it is stated, makes them ideal for the production of pastel effects, an innovation in the dyeing of dress materials.

Amacel Blue G G—(AMER. ANILINE PRODUCTS)—a new rapid dyeing (quick exhausting) bright greenish blue for Celanese. It is said to have excellent solubility and to be very suitable for heavy shades. It is stated that the rapid dyeing feature is especially important to hosiery and skein dyeing concerns, and to be important also in jig dyeing as well as in the dyeing of pigmented Celanese which is said to be quite resistant to the less soluble or slow dyeing dyestuffs.

Amacid Neutral Red 3 G Extra — (AMER. ANILINE PRODUCTS)—an interesting neutral dyeing, shading color said to be of considerable value to the hosiery dyer. It is also useful for combinations to be discharged on tin weighted silk. It is said to be of very good fastness to light, water, washing and perspiration.

Amacid Neutral Yellow G N S—(AMER. ANILINE PRODUCTS)—a silk dyestuff said to be of good tinctorial strength and to possess good fastness to light, water, washing and perspiration. It is further said to have very good affinity when dyed from a soap bath or a neutral weakly alkaline Glauber's salt bath. It is of particular interest to hosiery dyers and also of interest for dyeing weighted silks. Dischargeability is said to be very good.

Amanil Bordeaux 6 B—(AMER. ANILINE PRODUCTS)—produces a bordeaux shade when dyed direct on cotton, viscose rayon, etc. It is said to have good fastness to light and moderate fastness to washing. It is suitable for color discharge style.

Amanil Brilliant Violet 4 B—(AMER-ANILINE PRODUCTS) — produces brilliant bluish violet shade when dyed direct on cotton, viscose rayon, etc. It is said to have fairly good fastness to light and washing. It is suitable for the discharge style when used with white pigment discharge paste.

Amanil Brilliant Violet R—(AMER. ANILINE PRODUCTS) — produces a brilliant red violet shade when dyed direct on cotton, viscose rayon, etc. It is said to have fairly good fastness to light and moderate fastness to washing. It is suitable for the discharge style.

Amanil Developed Black O B — (AMER. ANILINE PRODUCTS)—a valuable addition for the hosiery dyer, said to leave acetate and silk fibers white. It is said to have good fastness to light and excellent fastness to washing. It can be diazotized and developed with the usual developers.

Amanil Developed Garnet R D—(AMER. ANILINE PRODUCTS) — produces a bordeaux shade when diazotized and developed with beta naphthol on cotton, viscose rayon, etc. It is said to be of good fastness to light, of very good fastness to washing and suitable for the discharge style when used with white pigment discharge paste.

Amanil Developed Violet B R D — (AMER. ANILINE PRODUCTS) — produces a blue violet shade when diazotized with beta naphthol on cotton, viscose rayon, etc. It is said to have very good light fastness and very good wash fastness and is suitable for the discharge style.

Amanil Fast Brown G 2 R—(AMER. ANILINE PRODUCTS)—said to be one of the brightest of the direct browns possessing good fastness to hot pressing and acids. It is further said to be of good solubility and therefore suitable for machine dyeing. It is claimed to be economical for union dyeing.

Amidine Fast Black G (Celanese White)—(CAMPBELL) — produces a very deep, intense black slightly on the green side. It is said to produce level shades on cotton, rayon, hosiery and mixed fibers and to leave Celanese decorations white. It is further said to be dependably uniform and to possess good exhausting qualities.

Anthra Milling Brown G — (ALTHOUSE)—said to be exceptionally level dyeing for a milling color and to be one of the few milling colors which will dye wool satisfactorily on a package machine. It is said to have good fastness to light and very good fastness to washing. It is stated that the shade is very unusual and that it lends itself especially well as a base for formulating any of the present day brown shades.

Anthra Milling Yellow L W—(ALTHOUSE—a new milling yellow said to be very fast to light and salt water. It is further said to possess excellent fastness to washing and fulling, to be fast to perspiration and to be unaffected materially with metals. It is claimed to be very level dyeing, to feed evenly and to be one of the most satisfactory dyeing milling yellows on the market.

Anthra Milling Orange C W—(ALTHOUSE—a new milling color said to be very fast to light and salt water and with excellent fastness to washing, fulling and perspiration. It is claimed that the shade is not materially affected with metals and that it is very useful for the shading of chrome colors.

Artisil Direct Orange 4 R P—(SANDOZ)—an economical red orange for use on acetate said to have good fastness to washing, perspiration and salt water for dyeing linings, bathing suits and knitted fabrics. In fabrics of mixed fibers it stains rayon and cotton only slightly, which stain is said to be easily removed with Arostit B L. It discharges to a pure white.

Artisil Light Blue B L—(SANDOZ) —is recommended by the manufacturers particularly for dyeing light shades on acetate cellulose either as a blue or in combinations, on account of its fastness to light and storing. The value of the color is not appreciated in dark shades in comparison with other types.

Azanthrene Colors — (ALTHOUSE) —It is claimed that this new line of colors are the first really fast to washing direct dyeing colors and it is further claimed that they are faster to washing than the corresponding shades of developed colors. It is said that they are very soluble and that their application is as simple as an ordinary direct color; further, that they give the dyer the advantage of having the shade under control at all times. This line is comprised of a fairly complete range of shades; yellows, reds, blues, greens, browns and blacks.

Azo Rubinole 3 G P—(SANDOZ)—an acid red said to have excellent ligh fastness and good fastness to perspiration with very good dyeing properties not usually obtainable in fast to light acid reds. It compliments a range of level dyeing acid colors of very good light fastness and good fastness to perspiration, suitable for ladies' dress goods. The leading colors of this group are Alizarine Light Blue 4 G L, Xylene Light Yellow 2 G P, Alizarine Light Violet 2 R C, Xylene Fast Orange P O and Xylene Fast Red 2 G P.

B

Benzanol Fast Rubine B B; Benzanol Fast Bordeaux B — (ALTHOUSE) — said to be unique in the fact that they are not sensitive to acid, a feature which, it is claimed, is not possessed by any of the usual direct garnets, bordeaux, etc. It is stated that these two colors, together with Benzanol Scarlet R, will produce any of the present day dark red or bordeaux shades and will not go flat on storing or when exposed to the moist atmosphere in the dyehouse.

Benzanol Violet B — (ALTHOUSE) —a direct color for cotton and rayon. It is stated that the distinctive featurc of this color is that the shade is not affected by metals and consequently is adapted for all types of machine dyeing or for aftertreatment.

Benzanol Black W C A — (ALTHOUSE)—a direct black dyeing cotton and silk a good union and leaving acetate white. It is stated that it dyes level, exhausts well and is faster to washing than the usually direct blacks of this type. It is highly recommended by the manufacturers for the hosiery trade.

Brilliant Alizarine Milling Blue G—(SANDOZ)—a bright milling blue said to combine the unusual qualities of very good light fastness and fastness to fulling. It is recommended by the manufacturers for application on raw wool and worsted tops. The fulling fastness is said to be sufficiently good to meet the requirements of men's wear woolen and worsted suitings and all but the most severely fulled overcoatings.

Brilliant Alizarine Sky Blue B S—(SANDOZ)—a very bright acid blue said to be fast to light and recommended by the manufacturers for use on yarn and piece goods. The product is said to have good fastness to perspiration and salt water and to withstand a moderate milling. The shade is only slightly dulled by chrome and may therefore be used as a shading color in combination with chrome colors.

C

Camacyl Brilliant Blue E; Camacyl Brilliant Navy Blue 2 B P—(CAMPBELL)—two bright blues said to have very good penetration and leveling properties. It is further said that they dye rapidly and exhaust well. It is stated that they are an excellent base for dark greens and suitable for all shading purposes on all types of acetate fabrics. They dye well at 140° to 180° F.

Camacyl Brown A; Camacyl Brown T New — (CAMPBELL) — two deep browns said to have excellent penetrating and leveling properties, high tinctorial value and good exhaust. They also are said to have good light fastness and to be suitable for all types of acetate fabrics.

Camacyl Develop Navy Blue H S—(CAMPBELL)—a bright navy blue said to be of high tinctorial value and much faster to light and a greener shade than Dianisidine. It dyes a bright yellow and develops in the usual way with B. O. N. A.

Calcogene Black 5 G; Calcogene Black G X Conc; Calcogene Black R—(CALCO)—new types of solubilized sulfur blacks. The solubility of these types is said to be a big advance in the

art of manufacture and to facilitate the handling of sulfur blacks for all types of dyeing.

Calcoloid Black BRD Double; Calcoloid Direct Black J D Double; Calcoloid Navy Blue N T D Double; Calcoloid Dark Blue B O D Double; Calcoloid Red Brown R D Double; Calcoloid Orange 4 R D Double; Calcoloid Orange R D Double; Calcoloid Golden Orange G D Double; Calcoloid Golden Orange R R T D Double; Calcoloid Pink F F D Double; Calcoloid Scarlet 2 G H N Double; Calcoloid Violet 6 R D Double; Calcoloid Yellow G C D Double; Calcoloid Yellow 5 G D Double—(CALCO)—dispersed vat powders which represent an extension and improvement of the previous line. They are recommended by the manufacturers for use in package and pressure machines either according to the regular method or by the improved pigment method as developed by Calco.

Calconese Diazo Black G D; Calconese Diazo Black B D N Dustless; Calconese Diazo Navy B; Calconese Diazo Navy B B D; Calconese Diazo Navy G D; Calconese Diazo Navy R C D; Calconese Diazo Navy 2 R D; Calconese Blue M C; Calconese Sapphire Blue 2 G; Calconese Brown R; Calconese Orange 3 R C; Calconese Red 2 B C; Calconese Red Y C; Calconese Scarlet G C; Calconese Violet R Y; Calconese Yellow G C; Calconese Yellow R C—(CALCO)—dyes for cellulose acetate fibers which represent an extension and improvement of the previous line. These standards are said to be especially processed to improve dispersion or colloidal solubility.

Celliton Discharge Yellow 5 R L—(GENERAL)—an acetate color producing a golden yellow shade said to be easily dischargeable to a clear white with Decroline Soluble Conc. The product is also said to be very suitable for direct printing.

Celliton Fast Blue FFB — (GENERAL)—said to possess a very clear shade and excellent leveling properties with the advantage of dyeing evenly with yellows and reds or other Celliton colors from any length of liquor.

Celliton Fast Brown B T—(GENERAL)—which produces a very attractive brown shade said to be of excellent fastness to light and to possess excellent level dyeing properties on acetate.

Celliton Fast Navy Blue B F—(GENERAL)—which is superior to the older General brand "B" in fastness to light and chlorine and shows also a brighter shade.

Celliton Fast Red BB—(GENERAL)—a new dyestuff for acetate rayon which produces a full bluish red said to have very good fastness properties and which is recommended by the manufacturers for printing.

Celliton Fast Yellow 5 R—(GENERAL)—a new dyestuff for acetate, which produces a fine golden yellow shade said to possess excellent light fastness.

Celutate Fast Blue G L; Celutate Fast Violet R L; Celutate Fast Red B L—(ZINSSER)—for acetate silk. These colors are said to possess excellent light fastness. It is claimed that due to their slow exhaustion, good leveling and penetrating powers, they are especially suitable for piece goods, yarn and novelty goods. In addition they are said to possess good fastness to water, washing and perspiration.

Chlorantine Fast Green 5GLL (Patented)—(CIBA)—a new member of the notably light-fast LL series of Chlorantine Fast Colors. This product has an especially pure clear tone and is considerably yellower than the type Chlorantine Fast Green BLL. It is particularly recommended by the manufacturer for the dyeing of cotton and viscose in skein or piece, for goods where fastness to light is the main consideration, such as draperies and upholstery goods. It is said to be particularly useful for dyeing viscose of unequal affinity in level shades. In fabrics of cotton and viscose, both fibers are dyed in a uniform shade, acetate fibers are only reserved in pale tones. Unweighted silk may be dyed in a neutral or slightly acidulated salt bath with Chlorantine Fast Green 5GLL, as well as in a broken soap bath. When dyeing half-silk in a neutral Glauber salt bath, the silk is dyed bluer and deeper than the cotton, but in an alkaline bath it remains lighter. In wool-silk mixtures, the silk dyes lighter than the wool in an acetic acid bath, but in a neutral bath the silk dyes somewhat bluer. In half-wool dyeing at a boil, the wool dyes brighter and deeper than the cotton. Chlorantine Fast Green 5GLL is not suitable for printing as an application print, nor are the dyeings on cotton or rayon dischargeable with hydrosulphites. An after-treatment with Sapamine KW slightly blues the shade, increases the fastness to water, but has no influence on the light fastness.

Chrome Luxine Yellow 5 G—(CARBIC)—a new chrome printing color which gives very clear greenish shades of yellow said to be of exceptionally good fastness to light. In this respect it is claimed that it surpasses some of the vat yellows. It is further said to have very good fastness to washing, to stand hydrosulfite and is recommended by the manufacturers for direct as well as colored discharges on cotton, viscose, silk and wool.

Chrome Yellow A Extra — (GENERAL)—which produces, according to the after-chrome method, bright greenish yellows said to have very good fastness properties and to dye very level. It can also be dyed according to the chromate method.

Cibacete Discharge Blue 3G (Patent Applied For)—(CIBA)—a new brilliant, greenish toned blue for Acetate fiber. Heretofore it is stated it has not been possible to produce so pure a shade of blue that would still be dischargeable. Cibacete Discharge Blue 3G has, moreover, it is claimed, a very good property of leveling so that by combination with such dischargeable colors as Cibacete Yellow GN, Cibacete Orange 2R, 4R, Cibacete Scarlet G, BR and Cibacete Red GR, GGR, most of the current tones of light, medium and navy blues, greys, biege and brown, may easily be made with good dischargeability. The dyeings are said to have a good fastness to light, very good fastness to water, perspiration, acids and crocking. Cotton and Viscose are scarcely tinted; wool and silk are tinted more strongly, but may be cleared by a treatment with Hydrosulphite BZ, water soluble. Cibacete Discharge Blue 3 G is said to be well suited for the direct printing of Acetate fabrics, the prints being fast to subliming.

Cibanone Blue 2R, Micro Powder for Dyeing and Cibanone Violet 6B, Micro Powder (Patent Applied For)—(CIBA)—two new dyestuffs, which on account of the superior fastness properties claimed for them are ranked among the best obtainable. Cibanone Blue 2R, Micro powder for Dyeing is dyed by method CI and yields a somewhat redder shade than Cibanone Blue RSN, but is said to possess a considerably better fastness to chlorine and mercerization. This product is adapted for the dyeing of cotton in all stages of manufacture, Viscose, Tubize and Bemberg in all goods requiring the highest degrees of fastness (kier-boil and bleach). Cibanone Violet 6B, Micro powder dyes a shade

considerably bluer than Cibanone Violet 2RB. The new dyestuff is said to be suited for the dyeing of all known types of rayon as well as boiled-off silk and for printing on Cotton, Silk and Rayon fabrics. It may also be used for dyeing yarns which have to be subjected to kier-boil and bleach.

D

Diagen Black M R (Patented)*—(DUPONT, DYESTUFFS DIVISION)—a homogeneous black which should be of interest as a self-shade for producing full blacks and also as an economical shading color for obtaining brown and blue shades.

Diagen Orange M G (Patented)*—(DUPONT, DYESTUFFS DIVISION)—produces bright shades of orange and may be used as an economical shading color for browns.

Diagen Red M 2 B (Patented)*—(DUPONT, DYESTUFFS DIVISION)—yields full bluish shades of red and is the bluest red of the Diagen series. It is recommended by the manufacturers as a self-shade for bright prints on cotton and it is also said to be of interest in combination shades requiring a red of this type.

Diagen Red M G Concentrated Solution (Patented)*—(DUPONT, DYESTUFFS DIVISION)—produces bright scarlet shades said to possess generally good fastness properties.

Diazamine Brown R B, 3 R A, and 6 R A—(SANDOZ)—three diazamine browns for direct dyeings, developed dyeings and suitable for alkaline discharge. They are said to be white dischargeable and it is stated that the alkaline discharge, used on developed colors, is particularly good.

Diazo Brilliant Orange G A Extra—(GENERAL)—a dyestuff which produces a bright yellow orange when diazotized and developed with beta naphtol. The shade is said to possess very good fastness to washing and excellent dischargeability.

Diazo Discharge Violet BD Conc.—(GENERAL)—which when diazotized and developed with Developer A, produces bluish violet shades said to be of good fastness to washing and is further said to be distinguished by its excellent dischargeability.

Diazo Olive G A—(GENERAL)—which, when diazotized and developed with beta naphtol, is said to produce easily dischargeable olive shades on cotton or rayon which possess good fastness to washing.

Diazo Rubine B H—(GENERAL)—which produces full bordeaux shades when diazotized and developed with beta naphtol. It is stated that it can be discharged to a pure white and that it possesses very good fastness to washing.

Direct Fast Brown B P Conc.—(YOUNG)—a direct dyeing brown of chestnut shade. It is recommended by the manufacturers for rayon due to the good wash fastness and level dyeing properties claimed for it. It is further recommended for dyeing union work for the same reason and also, it is said, for its superior affinity to cotton. It is stated that the color is rendered very fast by after-treatment methods.

duPont Anthraquinone Blue S W F—(DUPONT, DYESTUFFS DIVISION)—an acid color for application on woolen yarn and piece goods of all types. This product is said to possess very good general fastness to light, perspiration, salt-water spotting and to be fast to numerous other color-destroying agencies.

duPont Leather Gray M S—(DUPONT, DYESTUFFS DIVISION)—suitable for neutral shades of gray on suede and grain glove leathers.

duPont Neutral Brown 2 R S—(DUPONT, DYESTUFFS, DIVISION)—an acid dye suitable for use on pure and tin-weighted silks. It is said to yield pure whites when discharged. It is particularly recommended by the manufacturers for shading the silk in cotton-silk hosiery as it is said to possess excellent affinity for silk in a neutral bath.

E

Eriochrome Brilliant Red B L (Patent Applied For) — (GEIGY) — a new chrome red possessing the general properties and fastness characteristics of this series for wool. In brightness and pureness of shade it surpasses all the older Eriochrome reds and is said to be very suitable for dyeing wool in all stages of manufacture, not only by the afterchrome method but also on chrome mordant. It is further said to have very good dischargeability with hydrosulfite and is therefore applicable for the production of fast wool discharge effects. It is also suitable for bathing costume shades It is stated that it is also well adapted for direct printing on wool. When dyed on unweighted pure silk, mordanted with chrome alum or chromium chloride, it is said to give brilliant red shades of good dischargeability and high fastness to washing, water, perspiration and light.

Eriochrome Brown D K L (Patent Applied For) — (GEIGY) — a new homogeneous chrome color intended for all types of fast wool dyeing. It gives a neutral shade of brown, of good covering power and richness, said to be characterized by high general fastness properties and with particularly good fastness to decatizing, carbonizing and outstanding fastness to light. It is stated that the level dyeing properties are good so that it can be used not only as a self shade but also in combination with other dyestuffs to give all kinds of mode shades of high fastness to light. It can be dyed by all the usual methods for Eriochrome colors and can be applied to wool in all stages of manufacture.

Eriochrome Grey 3 B L; Eriochrome Grey 3 G L (Patent Applied For) —(GEIGY) — two new homogeneous chrome greys for wool fast dyeing, which possess the usual fastness properties of this series but are also said to have outstanding fastness to light even in pale shades, good shade in artificial light and excellent level dyeing properties. The 3 B L brand is to be regarded as the more important and it is stated that it can be employed as a fast to light grey or blue component for all kinds of mode, army and official shades on wool in every stage of manufacture. It can also be used in vigoureux printing. The 3 G L brand possesses similar fastness properties and pleasing shade in artificial light but is somewhat inferior in fastness to light. It is said to be valuable as a greening agent particularly if it is desired to improve the shade of a dyeing in artificial light. Both new brands are claimed to be particularly suitable for dyeing by the afterchrome method and are not recommended by the manufacturers so strongly for application by the Eriochromal and chrome mordant methods.

* Stabilized azoic color. Particularly recommended by the manufacturers for printing cotton. All of the colors in the range are said to be economical to use, to be readily soluble and to possess generally good fastness and working properties. The physical properties are said to be rigidly controlled; they are grit-free and finely milled. The danger of specking and scratching printing rolls is thus said to be entirely obviated.

F

Fast Golden Orange Salt G R—(GENERAL)—another important stable diazo salt added to the already long list which have been placed on the market by General. It produces on Naphtol AS, AS-D, AS-SW, AS-E and AS-TR valuable shades of clear yellow orange which are said to be outstanding in light and general fastness properties.

Fast Red F G Base—(GENERAL)—which on Naphtol AS-SW impregnation produces clear yellow shades said to be of excellent all around fastness properties. The new base is said to be distinguished by its excellent stability.

Fast Red GTR Base—(GENERAL)—which on Naphtol AS-ITR ground produces dyeing said to be of exceptional fastness to light, weather, chlorine, boiling and washing. It corresponds in fastness properties to the well known combination Naphtol AS-ITR — Fast Red ITR and is yellower in shade than the latter.

Fast Silk Yellow G—(GENERAL)—a new acid yellow brought out by the I. G. and offered to the trade by General. It is said to draw very well from a neutral or even slightly alkaline bath and is therefore said to be especially suitable for the dyeing of the weighted silk. It may also be used in the boil-off liquor. It is said to be of good fastness to light and washing.

Fastolit Brown L — (ALTHOUSE)—the first color to be brought out by Althouse in the fast to light field. It is a union color said to dye cotton, silk and wool practically the same shade in a boiling bath. It is claimed that this brown is unusual because it is the only dark brown having exceptional fastness to light. It is also said to be very fast to washing.

Fastusol Grey LVGL—(GENERAL)—a straight product said to be of very good fastness to light and recommended by the manufacturers for the dyeing of rayon and cotton, leaving acetate effects clean.

Fastusol Yellow L R T A Extra Conc.—(GENERAL)— a direct dyestuff said to be of very good fastness to light which produces a reddish yellow on rayon and cotton, and is also well suited for union dyeing. It is said to leave acetate silk white.

Formadine Dark Brown R B—(CAMPBELL)—the first formaldehyde brown ever made in America. It is intended for use in dyeing rayon in all forms; also cotton skeins, hosiery and mixed goods. It is said to possess excellent fastness to washing, soaping, milling and light. It discharges white. It is further said to give maximum value, time saving and economical operation.

H

Helmerco Blue 2 G; Helmerco Blue G; Helmerco Blue 2 R Conc; Helmerco Blue 4 R W Conc; Helmerco Green B G C; Helmerco Green M Y C; Helmerco Red 6 G C; Helmerco Red B C; Helmerco Yellow 2 G C—(CALCO)—Helmerco colors representing an improvement and extension of this line of dispersed pigment colors. These pigments are said to be characterized by excellent fastness to light and are intended for use in all grades of paper where this property is required.

Hydron Blue G A Paste and Hydron Blue R A Paste—(GENERAL)—two dyestuffs said to be especially suited for the production of navy blue shades on piece goods. Both dyes are best dyed with caustic soda and hydrosulfite. The dyeings are said to possess good fastness to light, excellent fastness to washing and moderate fastness to chlorine. It is stated that they are easily soluble and dye very level.

I

Indanthren Brown BRA — (GENERAL)—manufactured by General Aniline Works and offered to the trade by General Dyestuff. It is said to have excellent fastness to light, chlorine and washing and to be suitable for the production of heavy shades of brown by the pigment padding process as applied to cotton piece goods. It is recommended by the manufacturers for machine dyeing on account of its good solubility and levelling properties.

Indanthren Dark Brown R T Paste—(GENERAL)—which is best dyed according to the IW method. It is said to produce comparatively inexpensive deep chocolate brown shades of a reddish cast which are of interest both for dyeing yarn and piece goods. It is claimed to possess very good fastness to light and washing and excellent fastness to chlorine.

Indanthren Grey MG Powder Fine for Dyeing—(GENERAL)—a new vat dyestuff which yields considerably greener shades than Indanthren Grey M with which it corresponds in its fastness properties.

Indanthren Grey MG Powder is said to possess excellent fastness to light excellent fastness to washing and very good fastness to chlorine.

Indanthren Navy Blue 3 G Paste—(GENERAL)—a new vat dyestuff said to produce comparatively inexpensive Navy Blue shades of excellent fastness to light, very good fastness to washing and good fastness to chlorine.

Indanthren Olive Green BA Paste—(GENERAL)—a homogeneous vat dyestuff recommended by the manufacturers for the dyeing of cotton and rayon in its various forms. Indanthren Olive Green BA Paste is said to possess excellent fastness to light, to washing and to chlorine and is especially suited for the production of olive green shades. It is best dyed according to the IN process, but may also be applied by the I W process, if combinations with other Indanthrens should require it.

On account of its good solubility, it is said to be very well suited for the dyeing in machines, and to give good results in pigment padding.

Indanthren Turquoise Blue G K Paste—(GENERAL)—a new homogeneous indanthren dyestuff for the dyeing of rayon and cotton, producing a clear blue shade said to be of excellent fastness to light and to possess good fastness to washing and chlorine. It is a cold dyeing color and can be used successfully in combination with all those vat dyestuffs which have to be dyed at low temperature.

Indanthren Yellow 4GK powder Fine for Dyeing—(GENERAL)—a new Indanthren dyestuff which yields on vegetable fibers and rayon a greenish yellow of a fastness to light which, it is stated, has not previously been achieved with the same shade in the Indanthren range. It is expected therefore that it will be used for dyeing curtains and hangings in any depth of shade without limitation. It is stated that it has good fastness to washing and is fast to soda boiling, chlorine and peroxide, and when the usual precautions are observed will resist the color bleaching process. In mixed fabrics of cotton and rayon both fibers are dyed the same shade. It is stated that dyeings can be discharged to a white with neutral or alkaline Rongalite C discharge without the use of Leucotrope W conc. The product is not suitable for direct prints.

Indigosol Brown I B R; Indigosol Olive Green I B—(CARBIC)—two new additions to this line of water soluble vat colors. Both are suitable for the printing and dyeing of cotton, linen, viscose, cuprammonium rayon and mixed fabrics of these fibers by the usual methods. Both are said to be readily soluble and easily developed. They are especially recommended by the manufacturers for padding and dyeing, and in combination with Indigosol Blue I B C and Indigosol Golden Yellow I R K give tan, drab and khaki shades said to be of a high degree of all around fastness. The manufacturers state that their outstanding fastness properties combined with ease of application, perfect leveling and excellent penetration of heavy goods make them most valuable for the coloring of hangings and furnishing fabrics as well as for colored bleaching and for goods usually laundered. They may also be used for coloring pure silk and wool.

K

Katigen Bordeaux B Y A—(GENERAL)—a sulfur dyestuff said to yield on cotton as well as on rayon claret shades of a reddish cast. It enters in various combinations with the other Katigens. It is said to be easily soluble and to exhaust well. It is also available in the C F form to meet the copper and manganese specifications of the U. S. Rubber Association.

Katigen Brown B R—(GENERAL)—a sulfur dyestuff which produces medium shades of brown said to be of excellent all around fastness on cotton or rayon. It is said to have good levelling properties and excellent solubility making it well suited for machine dyeing, padding or jig dyeing. It is also available in the C F form to meet the specifications of the U. S. Rubber Association.

Katigen Brown RON Conc—(GENERAL)—This dyestuff produces on cotton as well as on rayon bright shades of a full brown said to be of good all around fastness. Its good level dyeing properties and its excellent solubility are said to make it suited for dyeing in all types of machines. It can be applied equally well on raw stock, yarn, warps, beams and on piece goods.

Katigen Direct Blue B R Extra Conc—(GENERAL)—a direct dyeing sulfur dyestuff of high concentration said to be suitable for the production of navy blue shades. It is stated that it may be used for dyeing cotton or rayon in any stage of manufacture as it is very soluble, dyes level and exhausts well, making it suitable for machine dyeing. It is also available in the C F form to meet the specifications of the U. S. Rubber Association.

L

Luxol Brilliant Green B L Supra (Patented)—(DUPONT, DYESTUFFS DIVISION)—spirit soluble color which is the brightest of the Luxol green types.

Luxol Fast Black S (Patented)—(DUPONT, DYESTUFFS DIVISION)—a spirit soluble color said to be suitable for spirit printing inks, leather, wood and pyroxylin or tinfoil laquers.

M

Monocel Orange R—(YOUNG)—this product is recommended by the manufacturers for the direct dyeing of acetate rayon. It is said to be of excellent fastness to light, to work well with other acetate colors and to develop to a rich Bordeaux with beta oxy naphthoic acid.

N

Naphtol AS-DB—(GENERAL)—an addition to their large range. A great number of desirable full brown shades of good all around fastness are said to be obtainable with specially chosen coupling agent.

National Alizarine Fast Blue R B—(NATIONAL)—an alizarine blue of brilliant shade; it is said to be level dyeing and of excellent fastness to light and perspiration.

National Black L B Base—(NATIONAL)—intended for use in producing fast blacks of naphthol grounds.

National Canary Lake Yellow P. L—(NATIONAL)—for producing greenish yellow lakes said to be of good fastness to light.

National Carbanthrene Flavin G C Quadruple Powder—(NATIONAL)—vat dye powder said to disperse rapidly. For printing and pad-jig work.

National Carbanthrene Khaki 2 G Paste—(NATIONAL)—an anthraquinone vat dye said to be of excellent fastness to light, washing, perspiration and boiling soap and soda. It is stated that it is of prime importance when producing khaki and olive drab.

National Erie Black N R G—(NATIONAL)—a black for cotton, rayon, and pure or tin-weighted silk said to be easily dischargeable. It leaves cellulose acetate practically clear. It is stated that it is excellent for unions.

National Erie Fast Brown S L; Erie Fast Green B L; Erie Fast Green 2 B G; Erie Fast Grey B L; Erie Brown C W S; Erie Catechine B B; Erie Catechine D C; Erie Blue Green F B; Erie Direct Red 2 B L—(NATIONAL)—direct dyes particularly intended for use in coloring union materials in which acetate rayon is to be left unstained.

National Erie Speck Dye Red S W—(NATIONAL)—covers cotton, silk and ligneous specks.

National Fast Acid Blue W F—(NATIONAL)—its stability in a boiling neutral bath is said to place this product in the front rank of dyes for hosiery. It yields navy blue shades on wool, silk or tin-weighted silk. It is said to discharge easily.

National Fast Acid Yellow GS—(NATIONAL)—said to be of particular interest to the dyer of silk or cotton and silk hosiery. It is also said to dye tin-weighted silk and to discharge to an excellent white.

National Milling Navy Blue 4 B—(NATIONAL)—a navy blue of the milling type said to be particularly suitable for pure or tin-weighted silk. It is further said to be easily dischargeable.

National Niagara Blue 2 B R—(NATIONAL)—a direct dye particularly intended for use in coloring union materials in which acetate rayon is to be left unstained.

National Niagara Chrome Blue Black B—(NATIONAL)—for producing navy blue shades on vegetable fibers. It is said to possess excellent fastness to cold water.

National Red R C Salt—(NATIONAL)—on Naphthol A S bottom produces bright shades of red said to possess excellent fastness to washing.

National Vat Pink F F Double Powder—(NATIONAL)—vat dye powder said to disperse rapidly. For printing and pad-jig work.

Nerol GGL—(GENERAL)—a new acid black brought out by the I. G. and offered to the trade by General Dyestuff Corporation. The dyebath is best prepared with weak acetic or formic acid

(Continued on page 675)

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

NOVEMBER 30, 1936

Officers of the Association

WILLIAM H. CADY, *President*
U. S. Finishing Co., Providence, R. I.

A. R. THOMPSON, Jr.—ELMER C. BERTOLET, *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline & Chemical Co., Boston, Mass.

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Lowell Textile Institute, Lowell, Mass.

LOUIS A. OLNEY
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

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HANS MEYER (New York) — ELMER F. SMITH (Midwest)
ROLAND E. DERBY (N. New England) — R. S. WHEELER (South Central)
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John N. Dalton, Secretary, Pacific Mills, Worsted Division, Lawrence. Mass.

Rhode Island Section
John G. Masson, Chairman, Rosemont Mill, Woonsocket, R. I.
Raymond A. Pingree, Secretary, 7 Sayles Ave., Saylesville, R. I.

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George L. Baxter, Chairman, Bradford Dyeing Association, 40 Worth St., New York, N. Y.
P. J. Kennedy, Secretary, E. I. duPont de Nemours & Co., Inc. 61 Thomas St., New York, N. Y.

Philadelphia Section
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R. W. Delaney, Secretary, National Aniline & Chemical Co., 200 S. Front St., Philadelphia, Pa.

Piedmont Section
Thomas R. Smith, Wiscasset Mills Co., Albemarle, N. C.
A. Henry Gaede, Laurel Soap Mfg. Co., Charlotte, N. C.

South Central Section
Walter E. Hadley, Chairman, Standard Coosa Thatcher Co., Chattanooga, Tenn
Murray B. Smith, Secretary, Standard Coosa Thatcher Co., Chattanooga, Tenn.

Midwest Section
Arthur T. Brainerd, Chairman, Ciba Co., 325 W. Huron St., Chicago, Ill.
Elias A. Johnson, Secretary, National Aniline & Chemical Co., 357 W. Erie St., Chicago, Ill.

South-Eastern Section
C. A. Jones, Chairman, Georgia School of Technology, Atlanta, Ga.
Robert H. Harris, Secretary. Spalding Knitting Mills, Griffin, Ga.

Lowell Textile Institute Student Section
Lee Gale Johnson, Chairman; Hugh Francis Carroll, Secretary.

North Carolina State College Student Section
A. E. Shumate, Chairman; J. W. Furr, Secretary

Members should notify the **Secretary** immediately of all address changes

Abstracts of Papers

To Be Presented at Sixteenth Annual Meeting

Methods for the Study and Control of Mercerization

SIDNEY M. EDELSTEIN
A. A. T. C. & C. Research Associate at University of Chattanooga

The paper will discuss critically methods which have been used for carrying out and controlling mercerization in the laboratory and methods for examining the luster, dye affinity and chemical reactivity of mercerized material.

The discussion will include the following:

(1) A description of the machines used by the writer for preparing large mercerized samples of yarn under widely different conditions and the means of controlling the tension and stretch on these samples during mercerization.

(2) A correlation of recent work on the Barium Activity numbers of mercerized material.

This work has shown that in many cases, the determination of Barium Activity numbers indicates the condition and previous treatment of the samples in addition to the presence of mercerization.

(3) The evaluation of dye affinity by the pyridine method which determines quantitatively the amounts of direct dyes on small mercerized samples; and the evaluation of dye affinity by visual examination of dyed fabrics prepared from mercerized samples. The advantages and disadvantages of both methods will be described as well as the conditions under which the use of each is most suitable.

(4) The visual examination of mercerized material for luster and luster measurements by means of a photoelectric instrument.

(5) Miscellaneous factors and methods of interest in the study of the mercerization process.

The Measurable Properties of Printing Pastes and Thickeners

DR. SIVERT N. GLARUM

A. A. T. C. & C. Research Associate at Jesse Metcalf Laboratory of Brown University

A method of measuring the flowing properties of printing pastes as well as the pastes used in preparing them will be described. These measurements permit the accurate comparison of pastes for such qualities as "body," "false body," "length," "shortness," etc., which have previously been very indefinite terms. These measured properties show a very direct relation to printing qualities. The characteristic flowing properties of a wide variety of thickening materials will be shown.

Fundamental Properties of Starch

G. V. CAESAR

Laboratory Director of Stein, Hall & Company, Inc.

In the scientific study of starches, much that has heretofore passed as knowledge must be unlearned. The literature (with some exceptions, notably the publications of the late T. C. Taylor) has been dominated by certain European concepts which have over-stressed chemical aspects to the almost complete disregard of physical aspects.

In the present lecture, attention is concentrated upon the all-important physical makeup of the starch granule and the interesting and commercially useful properties which flow from it. The organization of the granule is illustrated by lantern slides of drawings and photomicrographs, and the physical properties of starch gelatinization are shown in lantern slides of "Consistometer" charts. The pasting properties of eight starches are compared on one chart.

It is demonstrated that the physical state of organization of the starch granule is more nearly related to the pasting properties of starch than are variations in the so-called "amylopectin" content. Attention is called to the extreme looseness with which this term, "amylopectin," is defined.

The Evaluation of the Chemical Tendering of Cellulose by Cellulose Viscosity Measurements

F. H. GUERNSEY and L. T. HOWELLS

Cowles Detergent Co., Cleveland, Ohio

The chemical processing of cotton (cellulose) fiber, such as kier boiling, bleaching, scouring, mercerizing, dyeing, etc., results in some degree of cellulose degradation or formation of cellulose derivatives.

The ordinary routine measurement of such degradation is effected by means of the mechanical grab test and is reported as tensile strength losses.

Tensile strength loss is a mechanical test showing the composite effect of all positive and negative factors of strength involved. These include fiber length, degree of twist, weaving effects (floats, etc.) and defects, strains due to tension, and the chemical condition of the fiber. The mechanical grab test does not differentiate between the mechanical and chemical condition of the yarn or fabric.

From the standpoint of process control, production of quality, and market specifications, it is essential that the composite index, "Tensile Strength," should be dissected and its various elements considered in their own light insofar as possible.

An application of the solubility characteristics of cellulose in cuprammonium solution has been made to this problem and a reliable quantitative method of measurement of chemical degradation is now available for commercial practice.

Chemical tendering is accurately reflected in the viscosity or fluidity of the cuprammonium solution in which a sample of the cellulose has been dissolved.

The method permits accurate control of each process step and establishment of standard specifications as to the chemical condition of the cellulose in finished goods.

The Applicability of Spectrophotometry to the Solution of Color Problems in the Textile Industry

ARTHUR C. HARDY

Professor of Optics and Photography, Massachusetts Institute of Technology, Cambridge, Massachusetts

The results of spectrophotometric analysis are useful (1) because they enable fundamental color standards to be maintained and (2) because they facilitate the interpretation of the facts of color mixture. Until the advent of spectrophotometry, color standards could not be maintained over long periods of time. It has therefore been impossible to accumulate an extensive and accurate body of knowledge concerning the diverse phenomena of color. This is now possible because spectrophotometric results depend merely on the measurement of quantities and wavelengths of light and do not require the maintenance of material standards.

The interpretation of the facts of color mixture and other color phenomena is simplified by the use of spectrophotometry, primarily because a spectrophotometer is an analytical instrument, whereas the human eye is not. All colors of practical importance transmit or reflect the various components of the visible spectrum in a characteristic manner. A spectrophotometer evaluates these components one at a time, whereas the human eye responds to the mixture of the components in a complicated manner. The concepts of spectrophotometry frequently suggest procedures that otherwise could not be formulated. A case in point is the "whitening" of textile materials having a yellowish cast. By the use of spectrophotometry, the characteristics of the dye or pigment that will neutralize the yellow hue with the least sacrifice in brightness is readily determined.

Through the establishment of an international standard of white light and a standard observer, spectrophotometric

results may now be converted into values of brightness, dominant wavelength, and purity. In other words, the gap between spectrophotometry and colorimetry has now been closed.

The Chemistry of the Stabilized Azoic Dyes

Dr. H. A. Lubs
Associate Director, Technical Laboratory, E. I. du Pont de Nemours & Co.

The stabilized azoic dyes are defined as mixtures of a stabilized aromatic diazo body with a coupling component such as a β-hydroxynaphthoic acid anilid derivative. The historical development of this group of cotton printing colors is discussed. The more important stabilizers are described and various combinations for obtaining desirable shades are mentioned. The reactions involved are illustrated by an experimental demonstration showing the several steps in the development of the final color.

The Influence of Structure on the Color and Dyeing Properties of Mono-azo Naphthol and Naphthylamine Sulfonic Acid Dyes

Dr. Wallace R. Brode and Dr. Marion E. Griffith
Ohio State University

A series of dyes has been prepared in which aniline, orthanilic acid, metanilic acid and sulfanilic acids have been diazotized and coupled to alpha and beta naphthol, and naphthylamine and the available mono sulfonated naphthols and naphthylamines. These dyes have been purified by the guanidine method. Their absorption spectra has been observed in both the visible and ultra-violet regions of the spectrum. Dyed swatches have been prepared and samples have been subject to accelerated washing and fading tests. The effects of washing and fading have been measured through the reflection spectrum of the samples and comparison with the reflection spectrum of the original samples of the dyed fabric. From these data it has been possible to classify the dyes, to indicate the possible structure of unknown dyes of similar character and predict the dyeing properties of such dyes. Measurements were also made on the exhaustion properties of the isomeric dyes. Di and trisulfonated naphthol and naphthylamine dyes have been prepared but insufficient data is available to predict or correlate the results.

The problem is a portion of a wider program involving the study of the influence of position of substitution and character of the substituent group on the absorption spectra and dyeing properties of dyestuffs. Included in this work are such series as the indigo, thio indigo, disazo, mono-azo, phthalein and phthalocyanine dyes, upon which data have been obtained and published in part.

Reactive Groups in Wool and Their Industrial Significance

Dr. Milton Harris
A. A. T. C. & C. Research Associate at National Bureau of Standards

The purpose of this talk is to discuss the reactive groups in wool, the methods which have been developed for their quantitative estimation, and their relationship to practical wool processing.

From the standpoint of the physical stability of the wool fiber, the disulfide groups are of extreme importance. They are readily attacked by light, alkalies, and oxidizing and reducing agents. Any reagent which will alter the state of the disulfide groups will alter or destroy the physical structure of the fiber. The methods which were worked out for the study of the oxidation of these groups may be utilized in the control of practical bleaching and chlorination and bromination processes.

The basic groups (amino and guanidine groups) in wool account for the absorption of acids and acid dyestuffs whereas the acidic groups (carboxylic acids) account for the absorption of alkalies and basic dyestuffs. Under suitable conditions, both types of groups are determined by direct titration. The basic groups may react with sulfuric acid in two ways: namely, to form a reversible combination which facilitates acid dyeing and an irreversible combination which inhibits acid dyeing and produces the resist often obtained in the carbonizing process.

Colloidized Vat Dyes

Dr. M. L. Crossley and R. H. Kienle
Calco Chemical Company

It is shown that autodispersible colloidized vat dyestuffs approaching closely to water soluble substances may be prepared. The small particles of vat dye pigment are very highly dispersed in the presence of suitable protective agents. The dispersions behave in many respects like true solutions and may be used successfully for pigment dyeing. With modifications, the products also print smoothly on rayon.

The autodispersing properties of the printing forms are of necessity different from those of the dyeing types. A prerequisite for high tinctorial power in printing is a certain degree of flocculation or coagulation of the colloidal particles.

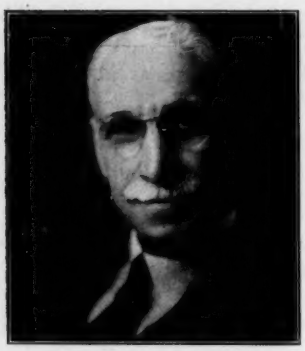
The theoretical problems underlying the preparation of colloidized vat dyes are discussed and also the fundamental and physical problems in their application.

The Suitability of Stainless Steel Compared with Other Metals in Bleaching

Jos. E. Goodavage
Philadelphia Textile School, for the Republic Steel Corporation of Massillon, Ohio

Stainless steel has been compared with other metals in its effect on the stability and activity of peroxide and hypochlorite bleaching baths.

The loss of weight of different metal containers and the amount of metal appearing in solutions of the various bleaching agents have been determined.



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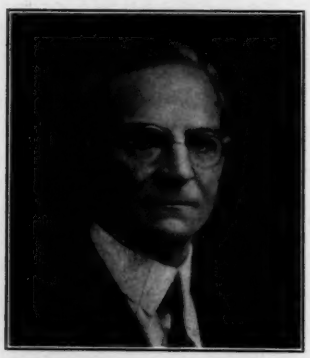

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Vice-President

CARL Z. DRAVES
Chairman
Technical Program Committee

ANNUAL M
AND CON

Program

FRIDAY, DECEMBER 4

10:00 A. M. Registration Opens in Foyer of Providence-Biltmore Hotel.

1:30 P. M. One hundred tenth Council Meeting.

2:00 P. M. Sight-seeing trips—Cars furnished.

2:30 P. M. One hundred third Meeting of Research Committee.

6:30 P. M. Buffet Supper in Foyer of Providence-Biltmore Hotel.

7:45 P. M. Official Opening of Convention.

7:50 P. M. Art in Textile Design by Bernice E. Jamieson of Rhode Island School of Design.

8:20 P. M. Moving Pictures of Manufacture, Fabrication and Application of Stainless Steel, presented by Curtis C. Snyder and Geo. W. Hinkle of the Republic Steel Corporation.

9:00 P. M. Entertainment.

SATURDAY, DECEMBER 5

9:30 A. M. Methods for the Study and Control of Mercerization by Sidney M. Edelstein, A. A. T. C. & C. Research Associate at the University of Chattanooga.

9:55 A. M. The Measurable Properties of Printing Pastes and Thickeners by Sivert N. Glarum, A. A. T. C. & C. Research Associate at Brown University.

10:15 A. M. Fundamental Properties of Starches by Geo. V. Caesar of Stein, Hall & Co.

10:40 A. M. The Evaluation of the Chemical Tendering of Cellulose by Cellulose Viscosity Measurements by F. H. Guernsey and L. T. Howells of the Cowles Detergent Co.

11:05 A. M. A Study in Detergency by L. P. Hall and D. H. Powers of Rohm and Haas.

11:30 A. M. The Applicability of Spectrophotometry to the Solution of Color Problems in the Textile Industry by A. C. Hardy of the Massachusetts Institute of Technology.

12:00 M. BUSINESS MEETING
Annual Reports of Officers and of Committee Chairmen; Election of Officers and Other Business.

PROVI
DECEMB

MEETING
NVENTION

RECESS FOR LUNCHEON

2:00 P. M. Are We Making Any Progress in the Textile Industry? by A. W. Buhlmann of A. W. Buhlmann, Inc.

2:25 P. M. The Chemistry of the Stabilized Azoic Dyes by Herbert A. Lubs of E. I. du Pont de Nemours & Co.

3:00 P. M. The Influence of Structure on the Color and Dyeing Properties of Monoazo Naphthol and Naphthylaminesulfonic Acid Dyes by Wallace R. Brode of the University of Ohio.

3:35 P. M. Reactive Groups in Wool and Their Industrial Significance by Milton Harris, A. A. T. C. & C. Research Associate at National Bureau of Standards.

4:05 P. M. Colloidized Vat Dyes by M. L. Crossley and R. H. Kienle of Calco Chemical Co.

4:35 P. M. The Suitability of Stainless Steel Compared with Other Metals in Bleaching by Jos. E. Goodavage of Philadelphia Textile School for Republic Steel Corporation.

5:00 P. M. End of Technical Program.

7:00 P. M. BANQUET. (Dress Optional).
Toastmaster: A. R. Thompson, Jr.
Speakers: His Excellency, Theodore Francis Green, Governor of Rhode Island.
Hon. James E. Dunne, Mayor of Providence.
Mr. William H. Cady.
Professor L. A. Olney.
Mr. John Nicol Mark.

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R 4 and 5

WM. H. CADY
President

HAROLD C. CHAPIN
Secretary

WM. R. MOORHOUSE
Treasurer

ALLISON R. FLETCHER
General Chairman Arrangements

MEETING, NEW YORK SECTION

THE first regular monthly meeting of the Fall season of the New York Section was held on Friday evening, October 23rd, at the Swiss Chalet, Rochelle Park, N. J. The usual informal dinner was held at 6:30 P.M. preceding the meeting.

Mr. E. H. Benzing of the American Bemberg Corporation delivered a paper on—Problems in the dyeing and finishing of fabrics containing Bemberg yarn and Mr. Fred A. Mennerich of the U. S. Testing Company spoke on—Microscopical examination of rayon filaments.

The usual open discussion followed the presentation of each of the talks.

Dr. J. E. Meili, Chairman of the Program Committee, indicated that this section could look forward to a program of excellent speakers throughout the coming months.

There was a total attendance of fifty-seven.

Respectfully submitted,

P. J. KENNEDY, *Secretary.*

MEETING, MID-WEST SECTION

THE Fall Meeting of the Mid-West Section was held Saturday, November 7th, 1936, at the Hotel Bismarck, Chicago, Illinois, eighty-six members and guests being present.

A nominating committee was appointed to report at the next meeting, their selections for officers for the ensuing year. The nominating committee consists of the following members:—

Mr. Clarence W. Wille, Chairman; Mr. Charles E. Maher, Mr. John Petty, Mr. E. J. Sindt, Mr. H. D. Boswell.

Mr. Herman C. Selya was appointed Chairman of the technical program committee for the next meeting.

Mr. Ralph A. Hoot, chief chemist of the Fort Wayne Water Works, addressed the meeting on the subject of "Water in Industry."

The meeting was adjourned at 10:40 P.M.

Respectfully submitted,

ELIAS A. JOHNSON, *Secretary.*

MEETING, PHILADELPHIA SECTION

THE Philadelphia Section held its first meeting of the season at the Penn Athletic Club, Philadelphia, on October 9th, 1936. After dinner at 7 P.M., Mr. Charles A. Simon of the Industrial By-Products and Research Corporation gave an extremely interesting address entitled, "A Scientist Looks at Consumers' Complaints on Textile Merchandise". Following this our member Mr. R. M. Ritter described his recent tour to Germany with the Olympic team. Later were shown several motion picture reels taken at the Annual Outing of the Section in June. There were 110 present. Mr. Herbert S. Travis presided.

Respectfully submitted,

R. W. DELANEY, *Secretary.*

MEETING, SOUTH CENTRAL SECTION

THE fall meeting of the South Central Section was held at the Andrew Johnson Hotel in Knoxville, Tenn., Saturday, October 24, 1936.

The meeting was preceded by the usual dinner. Chairman Walter E. Hadley called the meeting to order and the following papers with subsequent discussions were presented.

A Practical Method of Timing the Hosiery Dye Bath, by Mr. J. A. Crumbley.

Action of Enzymes in Desizing Rayon Piece Goods, by Mr. G. W. Searell.

Mr. A. R. Thompson announced that this year's annual meeting and convention would be held in Providence, R. I., December 4th and 5th.

Forty-six members and guests were in attendance.

Respectfully submitted,

MURRAY B. SMITH, *Secretary.*

APPLICANTS FOR MEMBERSHIP

Active

Wm. H. Adams—Technical Adviser, Wm. L. Barrell Co., New York, N. Y. Sponsors: A. F. Johann, L. A. Olney.

Archie G. Alexander—Dyer, Phoenix Hosiery Co., Milwaukee, Wis. Sponsors: M. O. Kremers, John Petty.

Edward J. Allard—Textile Colorist & Chemist, National Aniline & Chemical Co., Boston, Mass. Sponsors: W. R. Moorhouse, Edward Weber.

Earle K. Bush—Salesman, American Aniline Products, Inc., Cranston, R. I. Sponsors: James Wilkie, Elliot Broadbent.

Clyde F. Chace—Textile Chemist, Columbia Mills, Minetto, N. Y. Sponsor: A. D. Kolumban.

John H. Dulin—Dyer, Larkwood Hosiery Mills, Charlotte, N. C. Sponsors: A. R. Thompson, Jr., E. T. Laurin

Stanley W. Freeman—Dyer, Providence Dyeing, Bleaching & Calendering Co., Providence, R. I. Sponsors: P. F. Estey, R. W. Ward.

Ralph D. Greene—Colorist, Calco Chemical Co., Bound Brook, N. J. Sponsors: F. C. Dexter, G. A. Moran.

Emil C. Gruetsmacher—Supt. and Dyer, West Bend Woolen Mills, West Bend, Wis. Sponsors: A. T. Brainerd, J. G. Stott.

Fred H. Hallaman—Colorist and Asst. Print Shop Foreman, Sydney Blumenthal & So., Shelton, Conn. Sponsors: H. H. Taylor, Duncan Ferguson.

Thomas G. Hawley Jr.—Development Chemist, U. S. Rubber Products Inc., Naugatuck, Conn. Sponsors: F. W. Sturtevant, Milton Harris.

Ornulf Heiberg—Superintendent, Nydalens Compagnie Oslo, Norway.

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Harry F. Holmes—Laboratory Colorist and Demonstrator, Carbic Color & Chemical Co., Boston, Mass. Sponsors: H. E. Wieland, S. N. Mason.

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UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary or the American Dyestuff Reporter any vacancies which may occur in their businesses.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

NOTE: PERSONS WHO HAVE OBTAINED EMPLOYMENT SHOULD NOTIFY THE SECRETARY OR THE AMERICAN DYESTUFF REPORTER AT ONCE.

Prospective employers may file vacancies either with the secretary or the American Dyestuff Reporter.

A-B-1

Education—Graduate chemist and colorist from a leading textile institute. Speaks French fluently. High standing at school. Awarded 1st prize in chemistry. Member of honor society.

Experience—Knowledge of most processes of textile manufacturing and some experience in woolen and worsted piece and stock dyeing and color matching. Presently employed in other department but wishes to get into laboratory or dyehouse.

A-B-5

Education—Graduate of the University of Lausanne, Switzerland. Doctor's degree in Chemistry. Knowledge of French and German.

Experience—Eleven years with large bleaching, dyeing, printing and finishing plant as assistant Chemist and then Chemist in charge of the Laboratory. Experience in dyeing and printing cotton and rayon fabrics; research and analytical work. Woman.

A-B-7

Education—Evening school in textile dyeing.

Experience—2 years laboratory in dyehouse; 9 years dyer and foreman on hosiery, ribbons and rayon; 2 years assistant to superintendent. Can handle help efficiently. Desires position as supervisor or demonstrator of dyestuffs. Age 30; married. Prefers vicinity of New York.

A-B-C-1

Education—B. S. in Chemistry, Massachusetts Institute of Technology.

Experience—7 years with a prominent worsted mill as assistant chief chemist, chief chemist, and superintendent of dyeing and wet finishing. Thoroughly familiar with chemical problems of worsted industry. Age 33; single. Location unimportant.

A-B-C-2

Education—Graduate of Lewis Institute of Engineering of Chicago and graduate of Philadelphia Textile School (Chemistry and Dyeing department).

Experience—Has had extensive experience as assistant chemist and colorist in silk printing, dyeing and finishing; also dyeing raw stock wool; and dyeing and finishing cotton and rayon. Age 30; married; references.

B-3

Experience—Foreman piece dyer for the past 21 years. Can dye the following: celanese, rayon, cotton backs, wool, silk and mixed fabrics. Has knowledge of finishing and laboratory work.

B-F-1

Experience—As executive had charge of the dyeing of ribbons and piece goods for 6 years; spun silk yarn, fast and resisted dyeing for 8 years; hosiery for 12 years. Has been quite successful in all three of these mills. Age 50 married. Will go anywhere.

Annual Processing Review Number

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FIRST ANNUAL PROCESSING REVIEW NUMBER

WE present herewith, on the eve of the sixteenth annual meeting and convention of the American Association of Textile Chemists and Colorists, the results of our efforts in compiling information for our first annual processing review number. We believe that you will find in the pages of this issue much that will be of value to you in your work. We shall await with interest to hear how you receive this issue. As we intend to continue the publication of one issue each year that will review developments in the wet processing branch of the textile field, we shall appreciate your comments as to how we might make future issues of still more value to you.

We wish to express our thanks to those persons, recognized as authorities on particular phases of textile wet processing, who have taken the time and effort to review for us what has been done in their individual lines of endeavor. We are also grateful to the manufacturers of dyestuffs, textile chemicals and wet processing equipment who have furnished us with information regarding the new products or developments which they have made during the past year. We think you will find that section of this issue especially interesting, illustrating as it does the tremendous efforts which they are expending on your behalf.

MORE ON GETTING ALONG WITH PEOPLE—I

SOME months ago the AMERICAN DYESTUFF REPORTER ran a series of editorials entitled "On Getting Along with People." We did not know it when writing on this subject but a book was just being published under an almost identical title, "Getting Along with People." Our material on this broad subject was not exhausted but it seemed well worth while to pause to see what this author, Milton Wright, had written.

His book is very interesting but necessarily rather general. However, it fully confirms much of what we have already said, and of what we still have to say. Many of the principles of getting along with people in every day life are the same as those applying to the more specialized relations within a textile mill, while others have little application to such affairs. So we will proceed, following a few suggestions from this book but without finding it necessary to borrow much from it.

Whether the present writer himself has been successful in getting along with other people in a business way may be largely a matter of opinion because it seems that we never can know quite what other people think of us. Judging from the fact of having worked at different mills over a long period of time with very little perceptible friction, even with some people who were certainly difficult to get along with, it appears that the general principles which have been gradually worked out must be somewhere nearly correct. And, these general principles do check with the experiences and opinions of others who have written on the subject of the strategy of getting along with people. It has become more clear than ever from such reading that there is a great deal to it.

As before, this material is directed particularly to those who are not yet greatly experienced in working with other people in textile mills but the same principles apply to the more experienced man, except sometimes in an opposite way.

We have not meant to imply that all of these relationships are difficult because that would be far from true but there are many problem cases. For example, everything may be serene if you have merely routine duties and are satisfied with them, but things may be very different if you are progressive and want to do new things.

Instead of slowly building up a technic over a period of years, and slowly learning to live down unfavorable tendencies and handicaps, a little thought and planning should help one to progress much more rapidly in the art of getting along.

Strategy—A Useful and Legitimate Device

We all employ strategy to some extent in dealing with other people. Many times we apply it unconsciously or without any definite intention. Its common name is tact, and we usually respect a tactful person. Tact may come perfectly naturally, but if we set out to accomplish something, and definitely plan to do it in an indirect way, it may not seem the same, nor as desirable.

It may appear that the methods of strategy are but trickery or sly ways of getting your own way. In fact, getting your own way seems to be one of the main points in books along this line.

It is rather hard to say where legitimate strategy ends and trickery and unfairness begin. This is very largely up to the individual because general suggestions and advice cannot cover all cases and if it seems necessary to

carry the strategy too far in any given instance the matter should naturally be approached in some other way.

There are not any very definite tests that can be applied but if it is a question of making experimental runs or improvements in methods, you are trying to do something for the good of the organization and hence of all the people in it. It may really require only tact and a cautious approach but if a little indirectness or subterfuge is necessary its purpose is only to maintain friendly and helpful relations with the people in the mill so that something useful can be accomplished.

Perhaps the test is this—that there is no harm nor anything really objectionable in winning over a person by strategy if you are really trying to do something for him or his department and are sure of yourself. Usually you want the other fellow for a friend and intend and expect to be of help to him although he may not be able to see it yet. This can hardly be called trickery.

Or, in applying such principles you may have in mind your own personal advancement and then the case may be different. In general, of course, you are expected to put the good of the firm ahead of personal interests. In theory, at least, what is best for the firm will turn out best for you too.

In writings upon this general subject the fact may be noted again that the authors are usually concerned only with winning a point. The discussions are usually not concerned with whether the winning is right or wrong or whether it is for the best interests of all who may be involved. The book, "Robber Barons," gives plenty of examples of successful strategy but makes it clear at the same time that success is often very badly misnamed. Objectives that are quite wrong may be attained by very clever and entirely legal means.

Our discussion is entirely out of that class but tricky dealing brings out the point that your problem is also very different in another sense. You, in your mill connection will have to keep on working with the same group of people. Obviously, a strategem that leaves dissatisfaction or the feeling of having been tricked will not do here.

So much talk on the less vigorous ways of going at things may suggest the thought that one may be too much of a pussy-footer but the psychologist will tell you to try first to obtain your ends in the more quiet and peaceful ways. A person may be too much of a door mat, but in contrast, you have people who are continually in a fight. They are sure all the time that somebody, in fact one person after another, is trying to "get them in wrong" or "to put something over" on them. Such should naturally be on some more solitary type of work than the subjects of our discussion. If you happen to feel that way about one or two other people you may be right, but if you feel obliged to scrap with very many people it may be that it is you and not the rest of the army that is out of step. Then, something besides strategy may be needed.

Returning to methods of applying strategy, one which is quite generally recommended is flattery, exalting the other person's ego or allowing him to think particularly well of himself. This back-patting build-up may work very well if it is not carried too far. Some people can feel temporarily puffed-up and no harm is done, but others swell more and more until they think they know it all and are then harder than ever to deal with. It is risky to inflate too much if you have to work with the subject (of the inflation) for any length of time.

Some of the "rules" for strategy in handling people are a sad commentary on human nature. Apparently the "big" men are just as easy marks as the rest and fall for flattery as well as for deserved praise.

We are such funny creatures. We take pride in whatever we do, and so often in the wrong things. If two people take great pride in exactly opposite characteristics or behavior it is not likely that they are both right all the time.

Adaptability has been emphasized as one of the most important characteristics of one who would be successful in working with other people.

If some of the people who are such a problem could only see it, they might not be that way.

Of course, I am not talking entirely about the other fellow; I am talking about myself and you too.

One's opinions and one's agreements with the opinions of others on such a complex subject as that of getting along with people will depend very much upon the types that one himself has encountered as well as upon his own attitude and character. It is not possible to make general statements fit the experience of everybody, and there are plenty of exceptions to everything that may seem to be presented as a general statement.

In spite of all, getting along with other people in the mill or laboratory is very largely contriving to get the things that you need or want.

Note—The book mentioned above is "Getting Along with People" by Milton Wright, published by Whittlesey House, (McGraw-Hill Book Company, New York) in 1935.

WILLIAM C. SMITH

WILLIAM C. SMITH died at the home of his parents Mr. and Mrs. Fred C. Smith in Chadwicks, N. Y., on November 13th. He was born May 20, 1905 at Easthampton, Mass.

He graduated from the Utica Free Academy in 1921 and from the Lowell Textile Institute with the Bachelor's Degree in 1926, where he had an excellent record and was honored as a recipient of a scholastic prize. He was President of his class during the senior year and editor of the year book. He was a member of the Omicron Pi fraternity.

He was employed by the American Association of Textile Chemists and Colorists for seven years and was located at the Bureau of Standards in Washington. He was the first research associate of the Association and contributed very largely to the early development of the Association's research program.

He was a member of the American Chemical Society and of the National Association of Cotton Manufacturers.

NEW PRODUCTS

(Continued from page 664)

DYESTUFFS—CONTINUED

and exhausted, if necessary, with sulfuric acid. Full greenish blacks, said to be of good fastness to washing perspiration, water and saltwater, are produced. It is believed that this product should prove of special interest to the knitting trade. The fastness to light is said to be fairly good. It is further claimed to exhaust well from a neutral bath and is recommended by the manufacturers for union dyeing; it has also good affinity for silk.

Novochrome Fast Brown G, G T, R and 3B; Novochrome Bordeaux B B, G R; Novochrome Fast Bordeaux G; Novochrome Brill. Orange R R N; Novochrome Fast Scarlet R; Novochrome Fast Red R R; Novochrome Fast Pink B—(CARBIC)—these new colors are said to represent a distinct improvement in shade and fastness over older types. They are claimed to be superior especially in fastness to washing and light, to be perfectly soluble and to be capable of use for direct printing on cotton by the long or short steam method. It is stated that they are well suited for direct printing on rayon (except acetate), pure silk or mixed fabrics with Universal Mordant, as well as for dyeing pure silk, and are very fast to washing, good to very good light fastness and can be discharged to a pure white.

O

Omega Chrome Brown P G—(SANDOZ)—a chrome brown to be applied by all chrome methods said to have very good fastness to light, perspiration, potting and fulling. It may be dyed on raw stock, worsted top, yarn and piece goods. It is said to leave silk decorations white in light and medium shades. It is recommended by the manufacturers for men's wear suitings and overcoatings meeting the highest requirements.

Omega Chrome Orange M L—(SANDOZ)—a chrome orange said to have outstanding light fastness and very good fastness to fulling, potting and perspiration suitable for all men's wear requirements and may be applied on raw stock, worsted top yarn and piece goods. It is particularly recommended by the manufacturers to be dyed by the chrome-in-the-bath method but may be applied also by top chrome and chrome bottom methods. Because of its extremely good light fastness it is further recommended by the manufacturers for raw stock for carpets and for automobile fabrics.

P

Palatine Fast Black SRN Extra New—(GENERAL)—said to produce a jet black of good fastness properties on wool and silk and which is also said to be well suited for printing.

Palatine Fast Yellow 6 GEN—(GENERAL)—a new greenish yellow of the Palatine Fast series, which on account of its level dyeing properties is said to be of special interest as a shading color for combination shades. It is said to be of very good solubility and to be suitable for machine dyeing. It is further said to be of good fastness to washing, water and salt water, perspiration and crocking and therefore to be of special interest to the dyers of knitting yarn and carpet yarn. It is stated that it penetrates well and is recommended by the manufacturers for the dyeing of woolen and for hats. It discharges to a clear white with Rongalite CW.

Para Yellow RL—(GENERAL)—a direct dyestuff which when aftertreated with Nitrazol CF or diazotized Paranitraniline produces reddish yellow shades said to be of excellent dischargeability and good fastness to light and to washing.

Pharmasols—(CARBIC)—during the past year these products have been improved by improved stabilization. The new N and N N types are said to represent a distinct advance in the field of stabilized azoic printing colors by absolutely insuring the stability of solutions and pastes. These colors are now supplied in solutions most convenient to the printer, doing away, it is claimed, with the troublesome problem of dissolving and eliminating danger of decomposition and loss of color value.

Polar Brilliant Blue G A W—(GEIGY)—a new homogeneous dyestuff added to the Geigy range of Polar Brilliant Dyes. It produces a bright greenish blue of excellent shade in artificial light and is endowed with the typical fastness properties of the Polar series. It is said to have good fastness to water, sea-water, milling, stoving, carbonizing and perspiration. As regards fastness to acid, milling and cross-dyeing this dye is said to even exceed the older brands. It is further said to be chrome resisting and therefore can be used for shading dyes. It is claimed to be not sensitive to copper. Like the other Polar dyes it is suitable for dyeing wool of every description as well as silk and weighted silk.

Polar Brilliant Red G—(GEIGY)—a new addition to the Geigy range of Polar Brilliant Reds, being the yellowest brand of the series. While possessing the general properties of the series it is said to be rather superior to the older brands in fastness to water, seawater, perspiration and light. It is intended for use on wool and silk of all descriptions where it is desirable to obtain bright shades of good fastness to light, washing, milling, perspiration and sea water. The dye is said to draw well from a neutral dyebath and to withstand chrome; the shade becomes a trifle duller on afterchroming. It is further said to be suitable for direct printing on wool and silk.

Polar Brilliant Red 5 B—(GEIGY)—another addition to the Polar range possessing the same fastness properties. The fastness to sulfur stoving, to sulfite and to alkali are said to be very good. It is said to distinguish itself with an exceptionally bright bluish red shade. It is stated that it leaves cotton, artificial and acetate silk effects purely white, is chrome resisting and discharges well on silk. This color is said to dye fairly well from a neutral bath and therefore is suitable for feeding up the animal fibers in union and half-silk fabrics.

Polar Brilliant Red 10 B (Patent Applied For) — (GEIGY) — a further addition to this range which is rather bluer, appreciably purer, brighter and somewhat superior in fastness to light than the Red 5B brand. The fastness to stoving and sulfite is said to be very good. It is stated that like all Polar Colors it can be used on wool and silk of all description and on union materials of these fibers when it is desired to obtain bright shades with good fastness to washing, water, milling, perspiration and sea water. This color is said to dye well from a

neutral bath and to withstand the action of chrome, which dulls the shade very slightly.

Poly Acetyl Colors — (CARBIC) — a new group of dyestuffs especially developed for printing solid shades on mixed fabrics containing acetate rayon. These colors are printed with Universal Mordant and are said to give bright and perfectly uniform shades of good to very good fastness to washing, light and perspiration.

Ponsol Black B N S Quadruple; Ponsol Brown A G S Double (Patent Applied For); **Ponsol Direct Black 3 G S Double** (Patented); **Ponsol Flavone G C S Double** (Patent Applied For); **Ponsol Golden Orange 4 R S Double** (Patent Applied For); **Ponsol Golden Orange R R T S Double** (Patent Applied For); **Ponsol Khaki 2 G S Double** (Patent Applied For); **Ponsol Red B N S Double**—(DUPONT, DYESTUFFS DIVISION) — vat colors which are in the form of fine grains which are said to be stable even after prolonged storing. It is further said that they disperse very rapidly and are particularly suitable for dyeing by the pigment methods either for padding piece-goods or dyeing yarn in package machines. It is stated that because of the excellent manner in which they disperse, they are also highly suitable for dyeing by the reduced methods.

Ponsol Blue R B F Double Paste (Patented) — (DUPONT, DYESTUFFS DIVISION)—a vat color yielding reddish shades of blue and said to possess good fastness to chlorine and otherwise generally very good fastness properties.

Ponsol Brown 2 G N Double Powder —(DUPONT, DYESTUFFS DIVISION)—a vat color of interest for producing khaki and yellow brown shades said to possess excellent general fastness properties.

Ponsol Jade Green Supra C Paste (Patented); **Sulfanthrene Black P G C Double Paste** (Patent Applied For); **Sulfanthrene Blue 2 B D C Extra Paste** (Patent Applied For); **Sulfanthrene Brown G C Paste** (Patent Applied For); **Sulfanthrene Orange R C Paste** (Patent Applied For); **Sulfanthrene Pink F F C Paste** (Patent Applied For); **Sulfanthrene Scarlet G C Paste** (Patent Applied For) — (DUPONT, DYESTUFFS DIVISION) — vat colors which have been specially designed to assist the printer in overcoming the difficulties of obtaining smooth and well penetrated prints on delustered rayon. They are said to possess excellent penetrating and leveling properties and to yield perfectly smooth and speck-free prints on this fiber. It is stated that they may be used on bright rayon and acetate fiber materials with excellent results.

Pontachrome Azure Blue B R—(DUPONT, DYESTUFFS DIVISION)—a chrome color for dyeing bright, medium shades of blue on wool raw stock, yarn and piece goods.

Pontachrome Blue E C R—(DUPONT, DYESTUFFS DIVISION)—a chrome color for use on wool. It is said to be particularly interesting for use in dyeing navy shades requiring a rich, bloomy overcast.

Pontamine Fast Black L C W—(DUPONT, DYESTUFFS DIVISION)—a direct dyestuff recommended by the manufacturers exclusively for dyeing cotton materials containing acetate fibers that are to be left clear.

Pontamine Sky Blue 6 B X Greenish —(DUPONT, DYESTUFFS DIVISION)—a direct dyestuff yielding a bright, greenish shade of blue.

R

Rapidogen Red IGG—(GENERAL) —a new Rapidogen color producing very bright shades of red said to be of very good fastness to light, washing and chlorine. As far as the light fastness is concerned, it is said to surpass most of the well known Rapidogen colors. It is best dissolved with the aid of Cellosolve and printed and acid aged, according to the usual method for Rapidogen colors.

Rapidogen Red Violet RR—(GENERAL)—an easily soluble Rapidogen brand, producing bright red violet shades said to be of good fastness to light and very good fastness to washing and chlorine.

S

Silk Fast Grey BB—(GENERAL)—a homogeneous dyestuff said to have very good fastness properties. It is stated that it is well suited for the dyeing of pure and weighted silk and shows a very good dischargeability.

Supramine Blue R A—(GENERAL) —a new acid dyestuff which when dyed from a Glauber's salt-acetic acid bath and exhausted with sulfuric acid levels well and produces reddish navy blues said to be of good fastness to washing, water, perspiration and light. The fastness to steaming and hot pressing is said to be very good, and the fastness to crocking good. It is also said to exhaust well from a neutral bath and may be used as a shading color to cover the wool in union dyeing. It is said to have good affinity for silk.

Supramine Pure Blue B L—(GENERAL) — another new acid color brought out by the I. G. and offered to the trade by General. It is said to level well from a Glauber's salt-acetic acid bath and produces bright blue shades which, it is stated, have so far been unobtainable in such a combined good fastness to light, washing, perspiration and salt water. These fastness properties, it is claimed, make the new brand especially desirable for the knitting trade as a self color. The very good solubility claimed for it makes it very suitable for machine dyeing as well as for printing. It is further said that it has good affinity for pure and tin-weighted silk.

Supramine Red G L—(GENERAL) —a new acid red brought out by the I.G. and offered to the trade by General Dyestuff. Dyed from a Glauber's salt-sulfuric acid bath it produces yellowish reds said to be of very good fastness to light, and also to have the additional advantage of fairly good fastness to washing and perspiration. It is further said to have good leveling properties and is recommended by the manufacturers for combination shades together with Supramine Yellow 3 G L and Alizarine Direct Blue A G G or A R A. It is stated that cotton, rayon and acetate effects are left perfectly white. It is further claimed that Supramine Red G L will penetrate well and should be of interest for hat dyeing; the very good solubility making it very suitable for machine dyeing and printing. It discharges to a clear white with Rongalite.

Supranol Brown 5 R—(GENERAL) —a new acid color brought out by the I.G., which when dyed from a Glauber's salt-acetic acid bath produces bright reddish brown shades said to be of good fastness to washing, salt water and light and to be especially suitable for the dyeing of knitting yarn for sweaters, bathing suits, etc. It is further said to exhaust well from a neutral bath and is recommended by the manufacturers for shading the wool in union dyeing. This product is said to have very good affinity for both pure and tin-weighted silk.

V

Vegentine Brilliant Green B—(ALTHOUSE)—said to be a most unusual direct green because of its brilliancy and because it only dyes cotton and rayon leaving the silk, wool and acetate fibers white. It is particularly recommended by the manufacturers for color effect work and as a speck dye.

Vegentine Brown O B; Vegentine Brown O G—(ALTHOUSE) — have similar dyeing properties and characteristics but vary in shade. They are especially recommended by the manufacturers for the dyeing of full-fashioned hosiery. These colors are said to be very soluble, level dyeing and to leave the silk white in a degumming bath. Acetate effects or pecots are also left clear. They are also intended for extensive use in color effect dyeings.

Vegentine Formanol Black N—(ALTHOUSE)—a dual purpose black. It is claimed that it is the first really fast to washing direct dyeing black and that the amazing feature of this new dye is that it is faster to washing than many of the developd blacks. It is further said to be fast to perspiration and hot pressing and to leave pure silk and acetate exceptionally white. It is recommended by the manufacturers for varied color effect dyeing.

Visco Blue R S—(SANDOZ)—a level dyeing blue of unusual brightness. It is claimed that the fastness to washing, perspiration, alkalies, acids and hot wet pressing are outstanding features of this product when dyed direct. It is recommended by the manufacturers for the direct dyeing of rayon and cotton piece goods. It is also said to be useful as a combination color for novelty yarns composed of rayon and wool due to the level results on the rayon and the slight tinting of the wool. It is claimed that speck dyeing can be carried out very successfully because of its good affinity for cotton at low temperatures. Light fastness is fair in direct dyeings but can be improved considerably by after-treating with copper sulfate. In respect to its fastness properties and its exceptional brightness it is superior to the Pyrazol Fast Colors.

Visco Copper Blue E G—(SANDOZ)—a bright direct blue which is said to be very level dyeing on viscose and cuprammonium rayons. It is particularly recommended by the manufacturers for dyeing hosiery composed of cuprammonium rayon and mercerized cotton which even in deep shades is said to dye uniformly on both fibers. Combinations of viscose and cuprammonium rayon are also dyed quite uniformly. The fastness to washing is considered good. The fastness to light is very materially improved by after-treatment with Bluestone.

Textile Chemical Specialties

A

Alco D—(ALCO)—a new degumming agent and a well balanced preparation to be used in silk hosiery dyeing. It is said to scour and degum in one bath and can be used by the two bath or split bath method. It is further said to level dyeing and reduce sleaziness to a minimum. It is stated that it acts as a penetrant for close heels and toes in hosiery.

Alco M. P. Finish—(ALCO)—a new waterproofing agent claimed to represent a great advance in adding extra life and service to finished hosiery. It can also be used on other fabrics: wool, rayon and cotton. It is stated that fabrics finished with this product will permit numerous washings without the fabric losing its water repellency.

Aluminum Acetate — (NIACET)—a new product consisting of a 32 per cent solution of soluble basic aluminum acetate which is said to be of value in the preparation of water-repellent treatments for textile fabrics. It is explained that the treatment should not be termed "waterproofing" since it does not close the spaces between the threads of the fabric. The effect is rather to introduce onto the threads of the fabric and into the small capillary openings of the fibers a deposit of insoluble and water repellent aluminum soap, which, it is claimed, allows the passage of air but prevents wetting of the fabric by water.

Antifoam No. 25-2 — (HERCULES POWDER, PROVIDENCE DRY-SALTERS DIVISION) — a product produced to eliminate foam in printing pastes, size solutions, dye baths and starch mixtures.

Arabol 99—(ARABOL)—a penetrant said to be rapid and to possess excellent softening value — two characteristics which, it is claimed, are not often found together in this type one-piece product.

Arostit R F L—(SANDOZ)—a reducing agent with catalyst for discharge printing of certain vat and direct dyes. It is $NaHSO_2 . CH_2O . 2H_2O$ with calcium salt of disulfonated dimethylphenylbenzyl ammonium chloride.

Arostit Z E T—(SANDOZ)—for discharge printing of acetate rayon. It is $Zn(HSO_2CH_2O)_2$.

Aristol 3070—(ARISTA) — an amber colored, clear, heavy-bodied material, recommended by the manufacturers as a substitute for C. P. Glycerine. It is claimed to be just as hygroscopic, that it can be used wherever glycerine is used and is somewhat cheaper in price at the present time.

Aristol H Throwing Oil—(ARISTA)—a new mixture of vegetable and other oils recommended by the manufacturers for soaking hosiery tram. Its particular advantages are said to be: it can be used with a very small amount of potassium carbonate resulting in a bath having a lower pH (8.5 to 9) just before the silk is put in; silk will run equally well on damp days or dry days and will not stick to the sinkers and needles of the machine.

Aquaproof W—(ONYX)—a water-repellent for use in the one bath method on hosiery and all fabrics. It is claimed

that it is stable under all conditions of use, that it does not foam, break down or change colors, that it is not affected by hard water and that its water-repellent effects add a pleasing hand to hosiery and fabrics.

Aquarol—(ARKANSAS)—offered for producing a spot proof and water repellent finish on all the fabrics including hosiery. When used on cotton, silk, acetate, viscose and woolen piece goods, it is said to produce a finish that resist the wetting action of water and causes it to roll off the fabric without spotting or staining same. When used on hosiery, it is said to produce a completely spot proofed finish and a water repellency that causes rain, mud, water or slush that may be splashed on the hosiery to roll off without causing stains or dirt spots that are very difficult to remove from the hosiery. It is stated that it may be used in pure finishing baths or in conjunction with delustering, softening or sizing agents without affecting the efficiency of the other finishes or causing precipitation.

Avitex C (Patented) — (DUPONT, FINE CHEMICALS DIVISION)—a fat alcohol sulfate textile softening agent designed to give surface smoothness in addition to a full pliable finish.

B

Butoben—(MERCK)—a benzoate derivative said to have the property of retarding the growth of spores. It is further said to be non-toxic and to be effective in acid, alkaline or neutral conditions. It is intended for use as a mildew-resistant and preservative on yarns and fabrics as well as in sizing materials.

C

Calzine—(AMER. ANILINE & EXTRACT)—a entirely new type finish for rayon or silk that is claimed to give an absolutely waterproof, snag resistant finish and at the same time to give excellent feel and appearance to the goods. It is stated that only 3 per cent is necessary which is very economical for use.

Carbide Lubricant OLV — (CARBIDE) a lubricant and conditioning agent for use in the processing of fibers into yarn said to possess the correct softening and lubricating properties for satisfactory carding, combing and spinning. It is further said to be completely soluble in water, acid carbonizing and dyeing solutions. It is stated that bleaching, carbonizing, fulling, dyeing, and warp sizing may be performed without scouring the yarn or fabric, there being no danger of resists or unevenness from water repellent oils or lime soaps. It is claimed that the use of this lubricant eliminates or greatly reduces scouring costs and the scouring of knit goods, with its attendant shrinkage and other alterations, is made unnecessary. It is also claimed that it is non-oxidizing and imparts no odor or color to textiles over extended storage periods.

Carostrip—(CAROLINA) — a titanium sulfate liquid stabilized stripper intended for use in stripping direct and acid colors on hosiery and cotton goods. It is a 20 per cent titanium solution and is said to be stabilized for storage over a six months' period.

C C C C Carpet Gum—(COMMONWEALTH)—a size said to be of special interest to carpet and rug manufacturers.

C C C C Cominol G A R—(COMMONWEALTH)—intended for use as a detergent dyeing assistant, wetting and scouring agent.

C C C C Lighting Penetrator X—(COMMONWEALTH)—said to be a powerful wetting out and penetrating agent.

C C C C New Filling Wax V — (COMMONWEALTH) — a combination of waxes in a stable, emulsified form.

C C C C Soapotol G A R—(COMMONWEALTH)—intended for use as a detergent, penetrator and scouring agent.

C C C C Vegetable Gum—(COMMONWEALTH)—a very thin-boiling, highly converted gum.

C C C C Velvenit P—(COMMONWEALTH—a boil-off agent especially recommended by the manufacturers for use in bleaching.

C C C C Waterproofing Compound—(COMMONWEALTH — intended for use in waterproofing.

Ceranine S (Trade Marked)—(SANDOZ)—a softener for rayon and cotton. It has a stearine base.

Ceranine W (Trade Marked)—(SANDOZ)—a softener for rayon and cotton. It has a sulfonated oil base.

Cerol S (Trade Marked) — (SANDOZ)—intended for use in waterproofing all fibers. It is a stable paraffin emulsion.

Cerol T (Trade Marked) — (SANDOZ)—intended for use in one-bath waterproofing of all fibers. It is a stable paraffin aluminum acetate emulsion.

Cerol T F S (Trade Marked)—(SANDOZ)—a waterproofing compound said to be applicable at any temperature, even the boil. It is said to permit filling and finishing in the waterproof bath. It is used primarily on heavy fabrics, but is said to be suited to all textiles. It is a stable paraffin aluminum acetate emulsion with incorporated filters.

Clarinols—(HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—a series of self-emulsifiable oils for woolens and worsted. Clarinol W is one to use in producing worsted tops. It is said to be capable of remaining on wool over long periods, with scouring made easy.

Concental No. 75 — (HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—developed as a softening agent for cottons and rayons. It is said to be a very soluble, concentrated, well-sulfonated (sulfonated by a new process), high grade tallow. It has approximately 16 per cent H O. It is said to rank high as a softener in sanforized work. It is stated that there is no scum or foam on baths.

Creamsol—(BURKART)—a stabilized fatty acid emulsion, containing inhibitors to prevent oxidation or rancidity. It is intended for use as a softening and finishing agent on yarn, piece goods and hosiery. It is said to be particularly adapted for use on bleaches and light shades.

Culco Alkasol (Conc. Powder) — (CULBERSON)—a sulfated higher alcohol said to act as a super-penetrant and stabilizer in both acid and alkaline processing baths.

Culco Castorsol—(CULBERSON)—a group of C. P. sulfonated castor oils said to be noted for stability and good color.

Culco Decolorator "SS"—(CULBERSON)—a concentrated color stripper

said to be fast in action at below the boil. Sulfoxylate type.

Culco Hydro-Repel — (CULBERSON)—a one bath waterproofing agent intended for use on the majority of textile fabrics.

Culco Mulsol—(CULBERSON)—an emulsifier for mineral and vegetable oils and waxes.

Culco Pinesol—(CULBERSON) — a group of soluble pine oils. There is said to be a type for every processing need in the textile plant.

Culco Sprasol Colors — (CULBERSON)—a series of standard shades of solvent soluble anilines with a patented fixative agent intended for spray tinting of soft leather and certain animal fibers.

Culco Turksol—(CULBERSON)—a group of turkey red oils for textile wet processing.

D

Degumming Oil "S"—(BURKART)—said to be a properly buffered soap type silk degumming agent. It is claimed to be stable under all conditions. It is stated that it was developed for economical use in one-bath degumming and dyeing process. Goods are said to be left soft and full strength.

Delustran D (Trade Marked)—(SANDOZ)—a duller for printing said to be wash-fast. It is a Wolfram salt.

Delustran S T (Trade Marked)—(SANDOZ)—a duller for yarn or piece goods said to be wash-fast. It is a Wolfram compound.

Delustrate V-45 — (HART) — a new delustrating agent for silk and rayon piece goods.

Diastases S and C — (ROHM & HAAS)—diastatic enzyme preparations for the modification of raw starches for producing better printing gums more economically.

Digestase Special — (MALT-DIASTASE)—an extract from malted barley which, it is stated, has been processed to obtain a very high concentration of the enzyme diastase; said to be ideal as a desizing agent. By reason of its high diastatic properties it is said to readily liquefy the starch used in sizing and convert it into water soluble compounds, such as soluble starch, dextrine and sugars (principally maltose). It is further said to have free-flowing characteristics and to be easily handled and readily soluble. It is claimed that when properly used it will remove all of the sizing material (starch) without shrinking and will leave the goods in a softer cleaner condition. It is further claimed that it will not injure the organic structure of the fiber, nor will it leave stains or spots on the finished cloth.

Dispersine T (Trade Marked)—(SANDOZ)—a dispersing agent for acetate dyes. It has a highly sulfonated oil base.

Dull Finish C S D—(SANDOZ)—a dull finish for rayon. It is a titanium-clay duller.

E

Eulan B L—(GENERAL) — a new Eulan brand of I. G. manufacture, offered to the trade by General. It is said to be soluble in organic solvents and especially recommended by the manufacturers for use in dry cleaning. It is applied in a 10 per cent solution which is said to produce a safe protection against moths. It is further said to be of special interest for mothproofing finished goods, worn articles, or any goods sensitive to treatment with water.

Eulan C N — (GENERAL) — a new product of the Eulan series brought out by the I. G. It is applied from a boiling acetic, formic or sulfuric acid bath and can be used in combination with Acid, Palatine, Chrome or Monochrome colors. It is said to be very powerful and 1½ lbs. for 100 lbs. material is used to produce a lasting protection against moths which is not influenced by exposure to light, water, hot pressing, washing, perspiration or sea water. It is also said to stand stoving, chlorine, peroxide bleaching, potting, decatizing and a moderate fulling. It is further stated that Eulan C N is fast to dry cleaning. For protection against the carpet beetle it is advisable to increase the amount to 2 lbs. per 100 lbs. material.

F

Finish K B—(SANDOZ)—a finish for rayon and silk. It is a compound on a completely sulfonated oil base.

Finish N S—(SANDOZ)—a slip-proof finish for rayons and rayon mixtures. It is said to prevent slipping and shifting of warp and weft. It is a compound on a resin base.

Finish W F S—(SANDOZ)—a finish for rayon and silk. It is a compound on a completely sulfonated oil base.

Finishing Compound "M"—(SCHOLLER)—a product for imparting high repellency to all fibers. It is said to be especially valuable on hosiery in the combination, dull, repellent finishes as it is said to leave the fabric soft and elastic and due to its permanency, the hosiery can be washed innumerable times without it being removed. It is claimed that actual wear tests prove that hosiery finished with it are less apt to snag and run and the hosiery life greatly lengthened.

Fin-o-tex No. 1—(QUAKER CHEMICAL)—a translucent liquid said to be odorless, to contain no sugars, starches or pigments and to dissolve readily in hot or warm water. It is intended for adding weight to tubular knit cotton, rayon, real silk and wool. It is stated that best results are obtained with a machine manufactured by the Tubular Textile Machine Co. It is recommended by the manufacturers that this product be used in combination with a softening agent.

Fin-o-tex No. 51 — (QUAKER CHEMICAL)—a dark amber liquid intended for use as a softener and finish for cotton, rayon and real silk piece goods, as a penetrant and leveling agent for dyebaths, sizing mixtures and in many places where material is needed to withstand hard water, Glauber's salt, sodium chloride, mineral and organic acids. Among the claims made for this product are the following: will not discolor white goods or any fabrics; will not go rancid or create obnoxious odors; gives full soft hand, lesser amounts will do the same work as other products at an equal or lower cost.

Fin-o-tex No. 60 — (QUAKER CHEMICAL)—a cream colored viscous liquid intended for use as a one bath water-proofing agent said to produce a water repellent finish on textiles of all types. It is said to be suitable for silk, rayon, cotton, linen or wool and to make such fabrics shower proof or spot proof. It is also recommended by the manufacturers for spot proofing. rayon, silk crepe, hosiery, pile fabric, hat felt, etc. It is further said to be ex-

cellent for waterproofing umbrella cloth, shower curtains, tenting or awning fabrics, bathing suit fabrics, etc.

Flexin P—(AMER. ANILINE PRODUCTS)—a new assistant for the finishing of textiles such as viscose rayon, acetate rayon, hosiery, knit goods, cotton goods, etc. It is stated that a surprisingly small quantity of this finishing agent gives four combined effects which makes it very valuable in the processing of textiles, namely: softness, body, smoothness and clarity. It is said to eliminate rancidity in the finished material even when used with oils or fats to considerably reduce the amount normally required. The emulsion is stable except in the presence of mineral acids.

H

Hartex Weighter K F—(HART)—a metallic salt weighter for cotton and rayon knit goods. It is said to impart body and fine drapy hand to the fabrics. Other weighters said to be especially adapted for rayon knit goods are: Weighter No. 108, an organic weighter and Weighter No. 127, a gum weighter.

Hercules Soluble Pine Oils—(HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—a large range of these oils has been produced to meet any requirements as penetrants, dispersing agents and detergents. Some of their uses cover kier-boiling, scouring, dye-penetration, desizing, fulling, etc. They are designed for use on cotton, rayon, silk and wool.

HydRHoplex C-9, B-7, and J — (ROHM AND HAAS) — a new synthetic resin emulsion for textile finishes. The film formed is said to be tough, elastic and colorless. It is available in several hardnesses, the C-9 being the softest and the J, the hardest.

Hypol—(AKTIVIN)—a product intended for use in making wool unshrinkable and non-felting. The principle of the process is the retarding of the action between the wool substance and chlorine. By this process it is said to be possible to govern the reaction much better than with the usual methods. It is claimed that the wool keeps its softness and loftiness, acquires a better luster and does not become harsh and yellow. The process may be applied on threads or tops, hanks, woven or knitgoods. It is patented in the U. S. and abroad.

I

Invadine B (patented) — (CIBA) — a new wetting out agent for use especially in cold chlorine bleach baths. The product is said to be neutral and lime-resistant and may be used in baths containing lime. Another use of this new product is in the paddling of direct dyes on cotton goods which have not yet been boiled off; an addition of 10-20 gr. per liter is added to the dye solution and then the color developed later by a run through a boiling concentrated Glauber salt bath.

K

K-57 C (Discharge Printing Compound) — (REVERTEX) — a Revertex compound intended to simplify the use of latex in discharge printing. This compound is sold ready for use and is said to have very good keeping qualities. The use of latex as an assistant in discharge printing is said to have the following advantages: discharged cloth has a softer feel and is whiter than piece goods discharged with the paste containing egg albumen; the dry latex paste remaining on the cloth has no tendency to flake off; the substitution of a latex compound for egg albumen solution results in a considerable reduction in the cost of the discharge printing paste as the rubber in the latex is much cheaper than egg albumen.

Kem Rayon Super — Size V-10 — (KEM)—a rayon warp sizing compound intended for sizing rayon warps of the regenerated cellulose type. It represents the result of a research project which was started on March 1, 1935. This product is claimed to mark a definite advance in its field and is said to be in use now by a number of leading mills.

L

Liovatine S—(SANDOZ)—a catalyst for certain vat printing pastes said to improve brightness and strength of print. It is the sodium salt of benzylsulfanilic acid.

Liquid Deluster No. 95—(ZURN)—a new type of delusterer, which is neither paste nor powder but a clear heavy liquid. It is stated that the effects of this product are permanent and that there is no later detrimental reaction such as powdering. It is claimed that a number of trials have proven it entirely successful in permanently delustering silk and rayon hosiery, underwear and piece goods. Almost as clear as water itself, when mixed with water it instantly creates a fine white precipitate which is said to attach itself to the strands or fibers to be delustered, permeating the goods evenly and uniformly. It is said to be free from oil, starch, gum, glue or filler of any kind and to have no effect whatever on fillers, weighters, splash-proofers or other agents and is itself unaffected by acids, alkalies or starch. It is stated that in delustering hosiery it works satisfactorily on all weights: service, chiffon or sheer chiffon, and so its use should prove quite economical as only a very small percentage in ratio to the water is required.

M

Mercerol (Patented, Trade Marked)—(SANDOZ)—a wetting agent for grey mercerizing.

Merpol B (Patented); **Merpol C** (Patented) — (DUPONT, FINE CHEMICALS DIVISION)—two new auxiliary products for use in the textile industry. The former is said to be of especial interest as a detergent possessing good emulsifying properties, while the latter is said to be an unusually effective penetrant.

Metachloron — (ALTHOUSE) — a product intended for use to prevent the bleeding of heavy shades of cotton, rayon, silk or wool pieces. It is further said to prevent lay marks and the drawing of colors while the pieces are going through subsequent operations. It is applied in the last cold rinse water and the material is extracted without further washing. It is claimed that with its moderate cost and simple application it is an ideal proposition for dyers of all classes of merchandise using direct or acid colors.

Metasol—(BURKART)—an adjusted solution of sodium hexametaphosphate, having a pH of 8.5 in 0.5 per cent solution. It is intended for use as a water softener and as an assistant is scouring, bleaching and dyeing. Also available in dry form.

Metso 99 Sodium Sesquisilicate — (PHILADELPHIA QUARTZ) — a new product for use in cleaning where a high pH is required. It contains approximately 36.89 per cent alkali (Na_2O), 23.83 per cent silica (SiO_2), 39.2 per cent water (H_2O). It is said to be

free flowing and to dissolve in water with only a slightly positive heat of solution. At a concentration of 0.1 per cent by weight it is said to produce a pH of 11.6. It shares with other silicates the properties of (1) maintenance of pH until nearly all the alkali is neutralized; (2) inhibiting power necessary in cleaners; (3) free rinsing. It is said to find use in textile processing where a stronger buffered alkali than metasilicate is required.

N

National Avirol A H Extra—(NATIONAL)—wetting out and penetrating agent of an oily nature said to be useful in neutral, alkaline or hard water. An unusual property is said to be a uniform wetting out action at all the temperatures of textile processing. It is further said to be particularly useful in hosiery processing.

National Nacconols (KP, KPR, FB, N)—(NATIONAL)—sulfonated derivatives of synthetic organic products of high molecular weight, said to be scientifically planned to provide maximum detergent and wetting out action under the most adverse and difficult conditions. It is stated that it is generally useful in all textile processing where special problems of washing or wetting are presented by hard water, presence of soluble salts or variations in pH of solutions. Various grades or marks permit selection for most effective handling of a wide range of problems.

National Novonacco—(NATIONAL)—basically similar to the Nacconols but is modified to provide maximum wetting out properties rather than detergency. It is said to be useful throughout the pH scale and to be unaffected by hard water. It is stated that it is particularly useful where surface tension lowering is desired under strongly acid or alkaline conditions.

National Novonacco NN (NATIONAL)—a specialty developed for wetting out in sulfuric acid carbonizing liquors.

Neutralite X B—(DETERGENT)—for fulling and scouring. It is claimed that no trouble at all was experienced in fulling a heavy overcoat material containing quite a bit of shoddy and very heavily oiled, to the exact width desired at a minimum temperature throughout the fulling process which required only one-half the time previously used. The fabric was then scoured in a solution of this product, rinsed and centrifuged and, it is stated, a test with phenolphthalein gave no discoloration.

Nilo T C—(SANDOZ)—an emulsifier for vegetable and animal oils, fats and waxes. It has a sulfonated oil base.

O

Orthcpol A Concentrate — (AMER. ANILINE & EXTRACT)—used for degumming. It is stated that the amount necessary to secure satisfactory degumming results is never more than one half the amount of other degumming agents.

P

Parapon R—(ARKANSAS)—said to be a very powerful softening agent to replace sulfonated oils, tallows or other softeners in all finishing operation with greater efficiency. It is stated that it may be used on all types of fabrics and will produce a very desirable softness and full feeling hand which, it is claimed, is impossible to obtain by the use of ordinary softeners. It is also said that it does not turn rancid and therefore goods do not develop any offensive odor during storage and will retain the finish indefinitely; may be used on every type of fiber and fabric where complete softness and a good full hand in the finish is of prime importance. The manufacturers particularly recommend it for finishing viscose and acetate crepes or flat goods and also such cotton fabrics as broadcloths and madras shirtings. It is said that in finishing hosiery it produces the correct smoothness required without affecting or breaking down the body of the finish.

Parapon S A—(ARKANSAS)—said to be a powerful and highly efficient wetting out, penetrating and dyeing assistant. It is further said to be soluble in acid, alkaline and neutral solutions and to not be precipitated by hard water. It is also said to be stable in solutions containing appreciable quantities of dissolved salts. Because of these properties it is stated that Parapon S A may be used in every dyeing operation. Other claims made are: it permits rapid and complete penetration of the dye liquor into the fiber and consequently produces uniform and solid shades throughout the stock, yarn or piece being dyed; it permits uniform and complete exhaustion of the dyebath and thus improves the efficiency of that operation.

Penetrene—(HART)—described as a true sulfonated aromatic wetting out agent; claimed that it will not decompose under any pH conditions, e.g., boiling mineral acids. It is especially recommended by the manufacturers in processing high twist yarn, heavy fabrics or wherever exceptionally difficult conditions prevail.

Pentasicon T—(MERCK)—a mixture of products similar to Tytrovon B A (see below) and a condensation product obtained from an acetylsulfuric acid and a vegetable oil, which has, in part, been neutralized by an organic base. It is said to be stable in the presence of acids, alkalies, salts and in hard water. It is intended for use as a penetrant and dispersant and as an assistant in vat and naphthol dyeing, in the dyeing of acetate rayon and as a levelling agent for all classes of dyestuffs.

Permeko—(CAMPBELL)—a definite chemical product said to be designed especially to meet the requirements of a superior wetting-out and penetrating agent. It is said to be excellent as a wetting, lathering, cleansing, emulsifying and dispersing assistant. In particular, its use as a leveling assistant in dye baths for many different types of dyestuffs is said to have made it indispensable. Further it is said to facilitate solution of the dye with water and prevents balling and the floating of dry powder on the surface of the water. It is also claimed that: it may be used without hesitation in acid or alkaline solutions retaining efficiency throughout a wide pH range; it is itself neutral in reaction and can be readily applied under these conditions without any loss of effectiveness, especially where fine goods and delicate shades are in order; material having been processed will not change shade or become rancid upon storage because of its stability; in conjunction with softening and finishing agents, there is a wide range of application where softness of feel and the absence of stickiness is so paramount; as an integral part of printing pastes, sharp prints are obtained, leaving white grounds unaffected; it is unaffected by hard water or metallic salts.

Phosphamized Finishing Oils — (ONYX)—by the addition of a process termed "phosphamizing" it is claimed that any Onyx finishing oil becomes resistant to oxidation preventing rancidity, odors and discoloration during

long periods in storage, shipment or on the shelf. This process is further claimed to improve softness and to enhance finishing effects, to increase penetration, to give better lubricity and to stabilize the natural resistance of fabrics to heat in processing.

Pine Oil — (GENERAL NAVAL)— for use as an active constituent in wetting out, scouring and penetrating compounds. The oil, which is primarily a higher alcohol, is made soluble by combining it beforehand with soluble oils or soaps. It it claimed that the efficiency of the wetting out properties are in proportion to the alcohol content.

Pircine—(JORDAN)—for soaking silk and rayon. It is a fluid chemical compound said to possess certain disinfectant, deodorizing and fungicidal values. In addition it is also said to act as a penetrating agent and has value as a conditioner for silk which is to be run direct on the knitting machine. It has a pH of 9 and is said to contain no free caustic alkali or alkaline carbonates.

Printogen (Trade Marked)—(SANDOZ)—a lubricant and froth preventing agent for printing. It is a mixture of specially treated oils and organic solvents.

Protolin W—(ROHM & HAAS)—zinc hydrosulfite; for cotton and wool stripping.

Protozyme T. P.—(WOLF)— a new combination of proteolytic enzymes of the species *Aspergillus Oryzae*. It is said to have exceptional liquefying properties and is therefore especially adapted for the desizing of fabrics containing protein sizes, glues and gelatines. It is stated that Protozyme T. P. leaves rayons and acetates with a soft full hand and assists penetration of the dye.

R

Radiactine (Trade Marked)—(SANDOZ)—a dyeing and leveling compound for rayon and silk. An Algin compound.

Rayon Scour A (Patented)—(SANDOZ)—for scouring rayon particularly in cases where a linseed oil size has been used.

Redoxyvat—(ONYX) — small quantities used in vat dyeing are said to prevent premature oxidation. Its action is to keep vats in the leuco state for longer periods. By so doing it is said to permit dyeing of deeper, darker shades, to give better color value, to eliminate streakiness, to make possible larger dye concentrations and prevent crocking. It is stated that goods dyed with the use of Redoxyvat exhibit a noticeably softer, fuller hand and cleaner, brighter effects.

Reducin N S—(SANDOZ)—for producing yellow and orange discharge prints on indigo ground. It is dimethylbenzylphenyl ammonium chloride.

Reducin S—(SANDOZ)—for producing white discharges on indigo ground and certain vat and direct dyes. It is the calcium salt of disulfonated dimethylphenylbenzyl ammonium chloride.

Resolin N F (Trade Marked) — (SANDOZ)—a wetting agent.

Revatol S—(SANDOZ)—a kier boiling assistant for vat dyed materials, and a protective oxidizing agent. It is stated that it may also be used for padding rayon and cotton fabrics prior to discharging to prevent "facing." It is the sodium salt of meta-nitro-benzmesulfonic acid.

RHonite Powder 609; RHonite Powder 611—(ROHM & HAAS)—water-soluble synthetic urea-formaldehyde resins intended for use in the production of a crush-resistant finish.

RHonite Solution 414—(ROHM & HAAS)—a water-soluble, synthetic resin for special textile finishes.

RHonite W-224—(ROHM & HAAS) —said to be a new and unique synthetic resin emulsion for permanent textile finishes.

RHoflax A-6—(ROHM & HAAS)— a modified cellulose solution for permanent finish.

RHoflax D-8—(ROHM & HAAS)-- a cellulose solution for permanent finish.

RHoflax F-4-C—(ROHM & HAAS) —a cellulose solution containing an excess of Triton B and said to have a greater dissolving and swelling action on the fabric for special applications in producing permanent finishes.

RHoplex—(ROHM & HAAS)—said to be a tough, flexible, water-clear resin in organic solvents for specific textile applications.

Rinfors L (Patented)—(SANDOZ)— a scouring assistant intended for use especially on rayon sized with linseed oil.

S

Sandocarnit (Trade Marked)—(SANDOZ)—a wetting agent.

Sandoset G — (SANDOZ) — intended for use in fastening direct dyes.

Sandofix (Trade Marked) — (SANDOZ)—intended for use in fastening direct colors on rayon, cotton and pure silk.

Sandozol K B (Trade Marked) — (SANDOZ)—a dyeing and finishing oil and dispersing agent. It is a compound on a completely sulfonated oil base.

Sandozol N (Trade Marked)—(SANDOZ)—a wetting agent characterized by its efficiency at low temperatures.

Sanfo-Tal—(STODGHILL) — a sulfonated tallow designed for use on goods that are Sanforized. It is stated that this tallow is sulfonated so that all the glycerine is left in the product and the degree of sulfonation is high enough to allow perfect solubility in either hot or cold water. It is claimed that by using an edible grade tallow and holding the temperature low enough, an unusually white, clean and odorless tallow is made.

Shirlan A (Patent Applied For); **Shirlan Extra**—(DUPONT, FINE CHEMICALS DIVISION) — two mildew-proofing agents. When the former is used in conjunction with Aridex W P (Patent Applied For) by the one bath method, it is stated that the material acquires resistance to mildew and water which two effects are unusually resistant to removal by weathering and moderate washing. Shirlan Extra is said to be suitable for mildew-proofing heavy cotton fabrics which are subjected to weathering but cannot be applied with Aridex W P in the same bath. It is claimed, however, that it will be perfectly satisfactory to apply it by the two-bath method.

Silk Soaking Oil M—(CAMPBELL)— for warps, said to disperse uniformly in solution to give thorough penetrating, full yarn coverage and excellent lubrication. It is further said to reduce friction and chafing to a minimum, to leave silk soft and pliable and to be easily removed. It is stated that actual tests have proven that this oil gives the silk a greater elasticity than any other silk soaking oil on the market.

Siltex Gum Brilliant, Extra Refined—(ONYX)—an almost colorless, water

white printing gum produced by a new process of extra refining, which is said to produce unusual clarity and cleanness of whites and colors. This gum is further said to be free of grit, foreign matter and lime. It is highly concentrated and is said to give excellent penetration. Other claims made for this product are: that both fine lines and blotches print clearly and evenly; that it does not foam, froth or thin out during run; that it washes out readily in cold water.

Softener S—(ALCO)—a softener for finishing bleached cotton and rayon said to leave the material white with absolutely no yellow cast or color.

Soluble Oil No. 421-N—(ARISTA)—a soluble mineral oil intended for use as a stock wool lubricant. It is said to emulsify readily with mineral oil to make an emulsion which is very stable, neutral and will not separate out. It is further said to have no odor, that it will not generate any odor and that it will not stain.

Soromine W F — (GENERAL) — a new softening agent brought out by the I.G. It is said to not only impart a soft handle to the rayon or cotton treated but also fills the rayon. The product may be used together with any of the auxiliaries customarily used in sizing. The stability towards Epsom salt sizes is limited, i.e., it will, for instance, flake out after some time in Epsom salt solutions of 5-175 lb. per 100 gallons, but remains dissolved in higher concentrations so that it can be used in so-called weighting finishes. The addition of Igepon T will effectively prevent a precipitation of the Epsom salt.

S R Throwing Oil for Rayon — (ARISTA)—said to give a clearance of about 4½ per cent. It is further said to have an unusually large amount of cocoanut oil in its composition.

Starbuck Gum—(HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—a combination of gums so designed as to add body and quality to silk and rayon hosiery, and piece goods in finishing. It is said to keep rayon linings from crawling or creeping in die cutting and to be stable with finishing oils.

Staydry K-47—(HART)—a one bath waterproofing agent for cotton, silk and rayon.

Sulfonated Olive Oil C — (HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION) — a dye assistant and finishing oil. It is said to be made from virgin olive oil, well sulfonated, carrying high combined SO_3, concentrated, very soluble and stable in the presence of acids and some chemical salts. It is further said to be a good carrier for many raw oils.

Supratol — (HART) — said to be a highly sulfonated oil, containing about 20 per cent organically combined SO_3 (dry basis); to be clearly soluble in concentrated salt solutions such as 30 per cent caustic soda, 50 per cent Epsom salt, 25 per cent anhydrous Glauber's salt, etc. It is further said to be lime-proof and acid-proof and is recommended by the manufacturers in vat dyeing, mercerizing and as a softening agent in weighting goods with Epsom salt preparations.

T

Tallasize — (ARABOL) — said to replace tallow pound for pound in sizing. It is said to be completely saponifiable and to blend perfectly with starches and other type gums.

Tetracarnit (Patented Trade Marked) —(SANDOZ)—a solvent for dyestuffs and a dispersing and leveling agent. It is an aqueous solution of heterocyclic bases.

Textile Purge—(DETERGENT) — a wetting out agent. It is also said to be a most efficient kier boil assistant. It is further said to have a tremendous buffer effect on the sodium hydroxide solution which permits a reduction in the initial pH value and carries this lowered caustic strength to the end of the process without further dropping. It is stated that it has splendid detergent and emulsifying power as well as colloidal properties. Its use is said to permit a reduction of one-third to one-half the time of the usual boil out period and to assure a permanent white with little if any loss of tensile strength.

T. F. No. 457 Thermol—(QUAKER CHEMICAL)—a clear viscous liquid said to make a clear solution in plain water, lather freely, have a faint pleasant odor of solvent, be made from low titre fats and to liquefy soap solutions. It is intended for use in scouring woolen or worsted yarns or piece goods at normal tap water temperature. It is claimed that it will also work perfectly at boiling temperatures for scouring real silk, cotton or rayon.

Thiotan M S (Patented; Trade Marked)—(SANDOZ)—a mordant for basic and acid dyes on rayon and cotton. It is a sulfur derivative.

Thiotan R S (Patented; Trade Marked)—(SANDOZ)—a resist used in union dyeing said to prevent cotton colors from drawing on the wool. It is a sulfur derivative.

Tramolin—(HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—a superior sulfonated olive oil said to be suitable for finishing rayon fabrics and as a base for carrying raw oils.

Triola — (ARABOL)—a degumming agent said to be extremely effective and rapid—a time saver. It may be used in the one or two-bath method.

Triton B — (ROHM & HAAS) — a tetra-substituted ammonium hydroxide intended for use as a cellulose solvent and swelling agent.

Triton K-60—(ROHM & HAAS)—an auxiliary catalyst and plasticizer for resin finishes.

Triton M-7—(ROHM & HAAS)—a wetting agent for caustic solutions of mercerizing strength up to 20 per cent.

Triton M-25—(ROHM & HAAS)—a wetting agent for caustic solutions of mercerizing strength with concentrations of 20 per cent or above.

Triton S-51—(ROHM & HAAS)—a wetting and emulsifying agent of the synthetic soap type said to be unique in its stability and increased detergency in strong acid solutions.

Triton W-30—(ROHM & HAAS)—said to be of use as a wetting, penetrating, dispersing and deflocculating agent for application in acid, neutral or alkaline solution.

Trocklin S — (MERCK) — a slightly acid emulsion of waxes which through a single immersion is said to produce a water-repellent finish on any fibrous material. It is stated that because of the fine dispersion of the particles (in all concentrations) thin, pliable films are deposited on the fiber. As a result of its fine dispersion and strong adhering property it is said that it is not easily removed from the fiber. It is claimed that fabrics treated with Trocklin S are fast to reasonable washing, and that they are completely permeable to air. It is further claimed that treated fabrics have added softness and pliability. This product, it is stated, may be applied to all textile fibers and also paper, straw, fur and many other types of material.

Tytrovon B A—(MERCK)—a product made by condensing cetylsulfuric

acid with a vegetable oil and an arylsulfonic acid, and sulfonating the resulting product. It is said to be easily and clearly soluble in water, and to maintain its efficiency in hard water and in the presence of acids, alkalies and electrolytes. There is said to be no danger of decomposition on the fiber when exposed to air and sunlight. Its function is as a surface-tension lowerer and emulsifier. It is stated that it can be used to replace or supplement soap in the scouring of all fibers, particularly wool, silk and fine rayons. It is further said to be adaptable for the washing of goods after printing.

Tytrovon Oil N—(MERCK) — the neutralized condensation product obtained from an acetylsulfuric acid and a vegetable oil. It is said to be clearly soluble in water and to be stable in the presence of acids, alkalies and electrolytes. It is intended for use as a dyeing assistant and finishing oil. It is stated that it can also be used in causticizing processes as a penetrant and also under conditions of high temperature and pressure.

U

Ultroil — (HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION) — a concentrated well-sulfonated castor oil. It is said to be very soluble in the presence of acids to a low pH as well as many chemical salts. It is stated that it is an excellent dye assistant and softening oil.

Ultroil B—(HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION)—a well sulfonated castor oil soap solution of high concentration and said to be readily soluble. It is further said to be stable to many acids and chemical salts. It is claimed to be an excellent emulsifier and finish for rayon yarn in cake or skein.

V

Vatronyx Printing Gum Powder—(ONYX)—for use in vat printing. It is said to give larger color yields and to add bloom and brilliance to colors; that it does not stick in engravings; that it makes a longer more elastic gum and therefore does not break fine lines; that it prevents "snaps" and streaks.

W

Warp Sizing Piedmont — (STODGHILL)—a material for use in mills where the cloth is bale dyed without desizing, as with khaki. It is stated that this size contains no mineral oil or locust gum and warps sized with this material, made into cloth and then dyed after wetting-out show a very smooth, even color. It is claimed that the use of this product will eliminate foaming.

Waterproofer No. 441 — (CAMPBELL)—said to meet every requirement of efficient waterproofing from the standpoint of stability, trouble-free use, economy and effective water repellency without detrimental effect upon the fabric. It works in a one-bath method and is said to add a pleasant hand to hosiery and fabrics.

Y

Yarnolene F-11 — (HART) — a clear, amber colored oil, used as a lubricant for rayon, cotton and visca yarn for knitting purposes. It is said to be self-emulsifiable, hence, it is claimed, it is more easily scoured out of the material, produces a more pliable, softer and better knitting yarn, and will not oxidize, gum or develop rancid odors upon storing.

Equipment

Wet Processing Machinery — *Laboratory Apparatus*

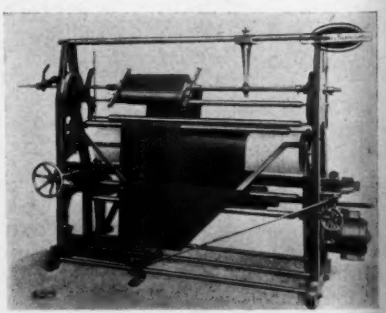
Photographs, Courtesy of Manufacturers

Abbott System—(ABBOTT)—a system of spool dyeing originally developed for the dyeing of fine worsted yarn and top. It is said that it has proved almost ideal for dyeing other materials. Cotton yarn, mohair yarn and top are all said to be successfully handled by slight changes in the winding of the material on the spools. The latest development has been in the direction of dyeing rayon yarn and top. The low density wound spools are said to allow a very large circulation of liquor at low pressure. Even and uniform dyeing is secured, it is stated, without matting and channeling caused by high pressures. Kettles are available in all metals for any type of dye bath. It is stated that the great interest in the use of rayon top and the desire to improve on the present methods of rayon yarn dyeing make this new development of unusual interest.

Ainsworth Spot Dyeing Machine—(AINSWORTH)—a spot dyeing or random dyeing unit constructed practically throughout of Monel. These units are not for sale but for rent on a monthly basis.

Binoc — (TAYLOR) — a new thermometer tubing intended to improve the readability of thermometers. Advantages claimed are: more than twice the accustomed angle of vision combined with high magnification of the mercury column; binocular vision at normal or greater than normal distances; triple lens construction gathers three times as much light and concentrates it behind the mercury column, making the column stand out in sharp relief; confusing empty-bore reflections are eliminated by the scientifically determined lens angle and extended opaque background. Available in all of the popular straight, angle and handled forms.

Combination Machine — (VAN VLAANDEREN)—a combination high variable speed tubing, reeling, doubling and measuring machine operating at a speed of 120 yards per minute.



Combination Machine

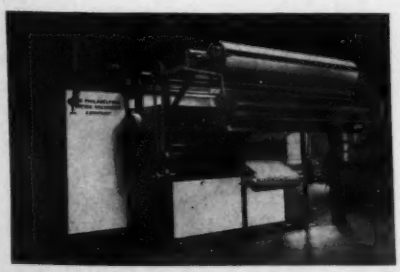
Combined Soaking Machine and Extractor—(ROCHESTER)—a new product in that the extraction feature is incorporated in the Rochester Silk Impregnator thus permitting extraction to take place in the same unit which does the soaking. Advantages claimed are as follows: elimination of extractor and maintenance of that machine; saving in floor space; since the silk skeins are handled less there is greater production in the winding room because of less breaks.

Continuous Open Soaper or Washer — (VAN VLAANDEREN) — for rayons. It has either electrical or mechanical synchronized nip rolls. The tanks

Continuous Open Soaper

are of stainless steel or other fabricated metals and the machine is ball bearing equipped throughout.

Dryers — (PHILADELPHIA DRYING)—it is stated that by application of the results of aeronautic research, to complement their own specialized knowledge, the engineers of this company have greatly improved the efficiency of all types of drying equipment and have developed a new high speed, high pressure fan, having blades of air-foil design and have so succeeded in controlling and directing air circulation that many textiles can be dried in a fraction of the time, and at a fraction of the cost, formerly required. In the New Tenter Dryers, drying is speeded by forcing air through the fabric, instead of merely across the surface; while in the New "Hurricane" Automatic Loop Dryers air is not only circulated at higher pressures but also at higher velocities than ever before possible. It is stated that as a result the new machines have 50 per cent to 100 per cent greater capacity than older models, they operate for about one-half the cost and turn out a product of higher quality.

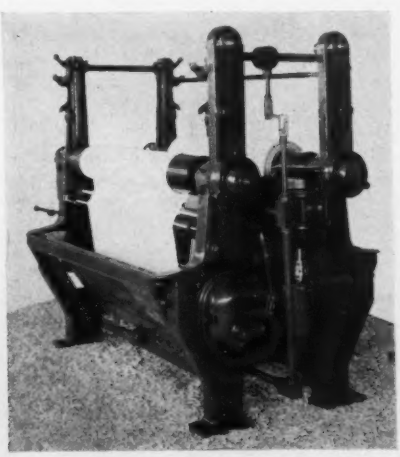


High Speed Hurricane Automatic Loop Dryer

Air movement is said to be directed downward in the automatic loop dryers and is so distributed, controlled and directed that all areas of the fabric encounter equal quantities of air at the same temperature and velocity across the entire width of the piece, thus assuring uniform drying, maximum capacity, high steam economy and protection from over-heating. The design of the new fan is said to give uniform airflow at all parts of the fan area, eliminate backflow and maintain high mechanical and static efficiency throughout the entire dryer. Another improvement is in the use of turning poles which is said to assure uniform drying, unform shrinkage and prevention of pole-marking. It is claimed that with these and other recent improvements the automatic turning pole loop dryer is unsurpassed for economy, efficiency and production, as well as being the most suitable machine for handling drapes, pile fabrics, knit goods, washed prints and other fabrics which benefit by uniform air drying at moderate temperatures and without tension.

It is further claimed that the "Hurricane" automatic loop dryer is an ideal machine for crease proofing fabrics at high temperatures and is admirably adapted to shrinking woolen cloth, cotton shirtings, denim, hair-cloth and other fabrics. When cooling and conditioning are desired subsequent to drying, in order to establish definite moisture regain and to improve the feel and appearance of the cloth, cooling and conditioning sections, subject to automatic control can be added so that drying, cooling and conditioning are successfully accomplished in one continuous operation.

Dye Jig—(VAN VLAANDEREN)—a new jig said to be truly tensionless.



Dye Jig

Both rolls are driven, the cloth is delivered from one roll at a predetermined rate of speed and is taken up by the other roll. A special expander arrangement is furnished which is said to make it unnecessary to apply tension to keep out wrinkles. The machine is also said to have the advantage of having a constant cloth speed and automatic stopping and reversing. Other features claimed are: rugged construction, ball bearing equipped throughout, only one A.C. or D.C. motor, constant or variable speed, all mechanical parts are self-lubricating.

Hastelloy A; Hastelloy C; Hastelloy D — (HAYNES STELLITE CO.) — three new alloys. Hastelloy A is a nickel-molybdenum-iron alloy said to be of high strength and good ductility, developed primarily for its resistance to hydrochloric acid. Hastelloy C is a nickel-molybdenum-chromium-iron alloy, representing a modification of Hastelloy A. This modification has reduced the malleability. The product is said to be particularly resistant to strong oxidizing agents such as nitric acid, free chlorine and acid solutions of salts such as ferric and cupric salts. It also is said to have good resistance to acids. Hastelloy D is a cast alloy composed of nickel-silicon-copper and aluminum. This is said to be particularly resistant to hot and cold sulfuric acid. It is stated that Hastelloy A and C alloys have been used by a number of dyestuff manufacturers in connection with severe corrosion problems involving the handling of hydrochloric acid, sulfuric acid and acid chlorine salts. In general the main use of the Hastelloy alloys in the dye industries is confined to the handling of acids and alkalies in the reaction mixtures rather than in the dyeing operation itself.

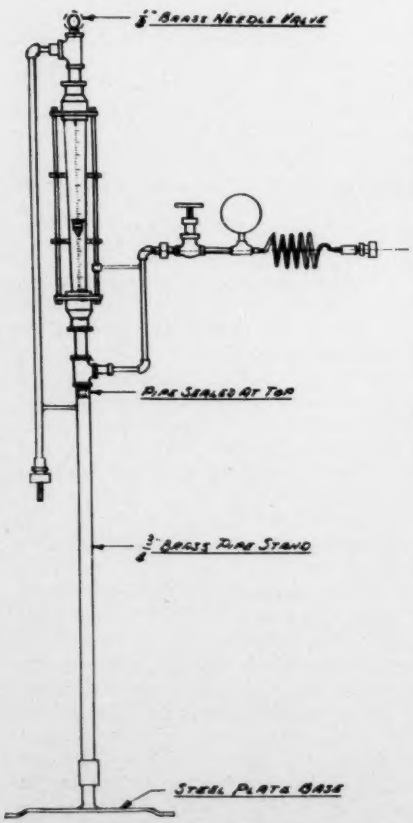
Monel Covered Cast Iron and Aluminum Rolls—(YOUNGSTOWN)—consisting of a relatively light covering of Monel sheet mechanically attached to the base roll by welding. It is stated that the Monel covered rolls are useful wherever rolls having non-rustable and corrosion-resistant surfaces are required. Successful installations have been made for immersion rolls, color transfer rolls on printing machines, calender rolls and other rolls required for textile finishing equipment.

Monel Buckets—(WHITEHEAD)—a line of Monel buckets recently made available at new low prices. The following sizes are included: 12 quarts, 14 quarts and 16 quarts. The bottom and sides are constructed of 20 gauge (.037 inch) high strength Monel sheet, electrically seam welded. The chime is of heavy 14 gauge (.078 inch) Monel, seam welded to the sides and extended one-half inch below the bottom, thereby protecting it against wear and damage through careless handling. The

ears are of 14 gauge Monel, spot welded to the sides and the bail or handle is of solid five-sixteenth inch diameter Monel rod.

Nickel-Clad Steel Size Kettles — (COLE)—size cooking and storage kettles constructed of nickel clad steel. During the past year a battery of 9 of these kettles was installed. Seven of these kettles 42 inches in diameter by 42 inches high are used for cooking and two kettles 48 inches in diameter by 48 inches high are used for storage; all kettles are equipped with Monel agitator and Monel heating coil. It is stated that with Nickel-clad steel construction former weaknesses of linings are eliminated and at the same time the sizing is in contact only with non-rustable, corrosion-resistant Nickel and Monel surfaces. It is further stated that, once installed, the Nickel-clad steel kettles will last for years with very little or no attention required for repairs or replacement.

Photoelectric Color Comparator — (EIMER)—an improved model. This apparatus is intended for use in comparing and measuring the total light transmission and turbidity of colored liquids. It operates as a wheatstone bridge, and the sensitivity is said to greatly exceed that of visual comparison. The use of various glass color filters permits the determination of color values. It is stated that it is also adaptable for the direct measurement of turbidity in the study of suspensions, colloids, etc., and for sulfate and similar determinations, by the Tyndall beam method.



Rotameter Assembly

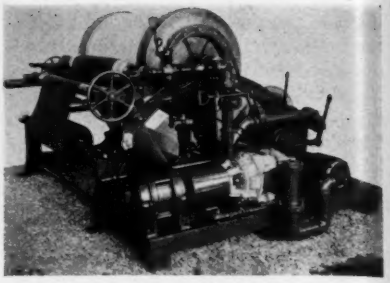
Photoelectric Reflection Meter—(EIMER)— an improved model. This apparatus is intended for measuring the total reflection of a great variety of materials. It is stated that any desired substances may be taken as the standard and the reflections of other materials may be obtained as percentages of the reflection of that substance. Ordinarily, however, a block of magnesium carbonate is taken as the standard substance, and the reflections of other materials are determined as percentages of the reflection of magnesium carbonate.

Rotameter — (VIRGINIA)—a device for indicating accurately the rate of flow of liquids and gases. It is stated that low rates of flow of gases can be accurately measured and duplicated. The Rotameter, it is claimed, has no parts that will wear out and is very simply constructed.

As shown in the accompanying sketch it consists chiefly of a glass tube, whose sides are not parallel, that is, the tube in the vertical position increases in the inside diameter from the bottom to the top. There is inserted in this tube a rubber float. The gas comes in at the bottom and goes out at the top and as the gas goes through the tube, it raises the rubber float. As the float raises in the tube, the space between the edge of the float and the wall of the tube becomes larger permitting more gas to pass by the float. The height of the float in this tube is directly proportional to the rate of flow of gas through the tube. The glass tube is calibrated for any given kind of gas and the tubes can be had in various sizes to cover a wide range of capacities.

It is stated that the Rotameter can be applied to any gas or liquid but has become particularly useful in the application of sulfur dioxide as an antichlor in bleacheries. This, it is claimed, permits a constant rate of flow which can be readily duplicated and does not permit excessive amounts of gas to pass into the solution to cause waste and odor difficulties.

Semi-Decator—(VAN VLAANDEREN)—said to be built for speed and quality performance, to give productive satisfaction, to have a cylinder which permits even steaming and cooling and to be so constructed as to eliminate work spots. The semi-vacuum drying adjustable batch cylinder is said to permit longer blanket life and also add to the quality of the works. It is stated that the blanket remains in its proper condition and need never be removed to be dried. It has a loading speed of 115 yards and an unloading speed of 140 yards per minute.



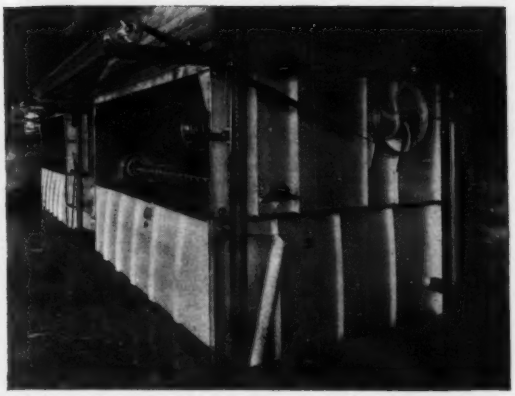
Semi-Decator

Taylor Fulscope Indicating Controllers — (TAYLOR) — a moderately air-operated controller of the indicating type for processes where close throttling control is imperative but a record of the processing is not essential. Among the outstanding features claimed for this instrument are: either high range or full range sensitivity; control point may be adjusted to any value within the control range; controller action may be quickly reversed; many standard control ranges to choose from.

Taylor Motosteel Evenaction Valves —(TAYLOR)—the first of this line to employ an all-steel welded construction. The new construction is said to be lighter in weight, stronger and to have greater resistance to shock and strains than the cast iron type. There are also other innovations.

Taylor Valv-Precisor—(TAYLOR)—a precision-valve-action unit said to be applicable to any range. It is stated that, in general, any air-operated controller, with the aid of this instrument, can position the valve disc 50 times more accurately when opposed by valve-stem friction and diaphragm hysteresis than when the device is not used.

Tru-Shade Dyeing Machine—(RODNEY-HUNT)—a dyeing machine, constructed of stainless steel which, it is claimed, will resist both rust and corrosion and has a surface which will neither tarnish nor absorb moisture or dyes. It is said that this machine can be rinsed out in a moment and is almost immediately ready for another run in another color. It is stated that Rodney-Hunt engineers have devised a means of constructing a tank of thin metal which is both rugged in endur-



Tru-Shade Dyeing Machine with capacity of 24 pieces of 22 oz. woolens.

A twelve-foot reel, one of the largest ever manufactured.

ance and light in weight. The walls are self-supporting which, it is claimed, provides the necessary strength but requires a minimum addition in weight. The stainless steel reels are of a new and patented construction and come in different types, according to use: plain bar, oval, triangular, folding hump and others. The reels have been reinforced against twisting by spiral reinforcement —a "torq-trussing" feature which, it is claimed, adequately provides the strength necessary to resist twisting forces which are present in every reel due to continual stopping and starting. This new reel design is further said to permit free expansion of all parts resulting from the temperature changes of dyeing and other processes.

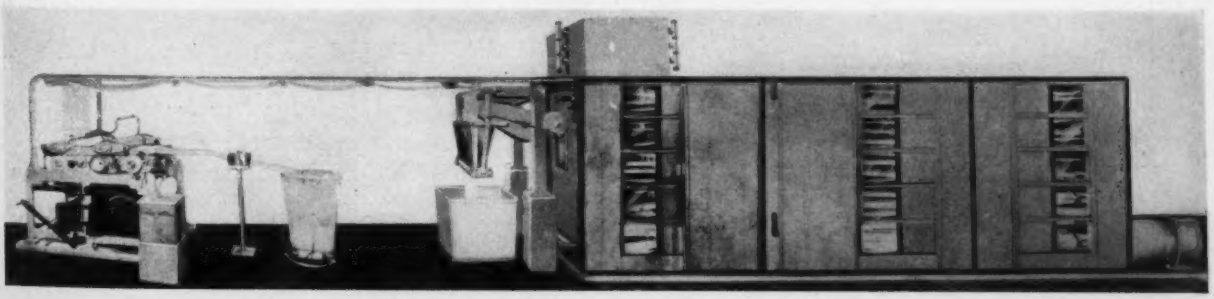
Tube-Tex Equipment — (BUTTERWORTH)—for handling circular knitted fabrics in processing, drying and finishing. Recent improvements are said to have modernized and made this equipment more efficient. It is available in several units and combinations.

Processor—an extracting and processing unit which replaces the centrifugal extractor and in one continuous operation is said to spread, extract, apply chemical finishes and flat fold the fabric preparatory to its entrance into a drying machine. It operates at a speed of 36 yards per minute. It is stated that the method of extraction by means of rubber squeeze rolls while the fabric is flat and free of all wrinkles will insure uniform moisture content throughout the piece and from piece to piece, will eliminate flower designs and whip marks and will eliminate the time factor and load capacity. It is further stated that when used for applying chemical finishes its value lies in the facts that it is fast, applies finishes uniformly and at a minimum cost.

Drying Machine ("C" Range) — used mainly in tandem operation with the above mentioned extracting and processing machine. It is a tunnel type dryer employing high air velocity and is said to dry approximately 400 pounds an hour of cotton and rayon underwear fabrics and as much as 600 pounds an hour of acetate rayons and woolen fabrics. High temperatures of air are used where the fabric is wet and as it passes through the dryer and loses moisture, the temperature of the air decreases proportionately and consequently, it is claimed, the dry fiber is never exposed to a harmful temperature and emerges cold. It is claimed that this dryer eliminates slat marks, stick marks and change in color. The average running speed of the machine is between 25 and 35 yards per minute. It is stated the machine is variable driven and may be changed from light weight to heavy weight fabrics with ease. When used in conjunction with the extracting and processing machine it still requires only one operator.

Finisher—a single pass steaming and finishing machine which is said to do in one operation the following: spread, steam, calender, measure and roll up knit fabrics of any size or weight with a cross line equally as straight as other machines manufactured expressly for the finishing of stripes and patterns. This unit has a variable speed drive when used as a unit and runs 15 to 45 yards per minute. It is said that this unit is widely used in conjunction with the above mentioned Tube-Tex combination where in one continuous operation, it is claimed that the fabric is taken in a soaking wet state from a dye tub and delivered in a finished roll ready for delivery to the cutting table. This combination of machines is known as the *"Tube-Tex" Combination "F" Range* and is said to be most popular with knit goods mills having a fairly large production. It is claimed that there is no other machine on the market which combines all the above listed operations into one.

Tube-Tex Combination "C" Machine



MANUFACTURERS

ABBOTT—Abbott Machine Co., Wilton, N. H.

AINSWORTH—Ainsworth Dyeing & Machinery Company, Utica, N. Y.

AKTIVIN—The Aktivin Corporation, 50 Union Square, New York, N. Y.

ALCO—Alco Oil & Chemical Corp., Trenton Avenue and Williams Street, Philadelphia, Pa.

ALTHOUSE—Althouse Chemical Co., Reading, Pa.

AMER. ANILINE & EXTRACT—American Aniline & Extract Co., Venango and F Streets, Philadelphia, Pa.

AMER. ANILINE PRODUCTS—American Aniline Products, Inc., 50 Union Square, New York, N. Y.

ARABOL—Arabol Manufacturing Co., 110 East 42nd Street, New York, N. Y.

ARISTA—Arista Oil Products Corporation, 249 Pearl Street, New York, N. Y.

ARKANSAS—Arkansas Co., Inc., 233 Broadway, New York, N. Y.

BURKART—Burkart-Schier Chemical Co., Chattanooga, Tenn.

BUTTERWORTH—H. W. Butterworth & Sons Co., York and Cedar Streets, Philadelphia, Pa.

CALCO—Calco Chemical Co., Bound Brook, N. J.

CAMPBELL—John Campbell & Company, 75 Hudson Street, New York, N. Y.

CARBIC—Carbic Color & Chemical Co., Inc., 451-453 Washington Street, New York, N. Y.

CARBIDE—Carbide & Carbon Chemicals Corp., 30 East 42nd Street, New York, N. Y.

CAROLINA—The Carolina Aniline & Extract Co., Inc., 2316 South Boulevard, Charlotte, N. C.

CIBA—Ciba Company, Inc., Greenwich and Morton Streets, New York, N. Y.

COLE—R. D. Cole Manufacturing Co., Newnan, Ga.

COMMONWEALTH—Commonwealth Color & Chemical Co., Nevins, Butler and Baltic Streets, Brooklyn, N. Y.

CULBERSON—Culberson & Co., Houston, Tex.

DETERGENT—Detergent Products Corp., Atlanta, Ga.

DuPONT, DYESTUFFS DIVISION—Dyestuffs Division, Organic Chemicals Department, E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.

DuPONT, FINE CHEMICALS DIVISION — Fine Chemicals Division, Organic Chemicals Department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

EIMER—Eimer & Amend, 18th St. and 3rd Ave., New York, N. Y.

GEIGY—Geigy Co., Inc., 89 Barclay St., New York, N. Y.

GENERAL—General Dyestuff Corp., 435 Hudson St., New York, N. Y.

GENERAL NAVAL—General Naval Stores Company, 230 Park Avenue, New York, N. Y.

HART—The Hart Products Corporation, 1440 Broadway, New York, N. Y.

HAYNES STELLITE CO.—Haynes Stellite Company, Kokomo, Indiana.

HERCULES POWDER, PROVIDENCE DRYSALTERS DIVISION—Hercules Powder Company, Providence Drystalters Division, Wilmington, Del.

JORDAN—W. H. & F. Jordan Jr. Mfg. Company, 3047 Amber Street, Philadelphia, Pa.

KEM—Kem Products Company, 229 High Street, Newark, N. J.

MALT DIASTASE—Malt-Diastase Company, 22 East 40th Street, New York, N. Y.

MERCK—Merck & Co., Rahway, N. J.

NATIONAL—National Aniline & Chemical Co., 40 Rector Street, New York, N. Y.

NIACET—Niacet Chemicals Corp., Niagara Falls, N. Y.

ONYX—Onyx Oil & Chemical Co., Jersey City, N. J.

PHILADELPHIA DRYING—Philadelphia Drying Machinery Co., 3351 Stokley Street, Philadelphia, Pa.

PHILADELPHIA QUARTZ — Philadelphia Quartz Company, 121 South Third Street, Philadelphia, Pa.

QUAKER CHEMICAL—Quaker Chemical Products Corp.. Conshohocken, Pa.

REVERTEX—Revertex Corporation of America, 80 Broad Street, New York, N. Y.

ROCHESTER—Rochester Engineering & Centrifugal Corp., 110 Buffalo Road, Rochester, N. Y.

RODNEY-HUNT—Rodney Hunt Machine Co., Orange, Mass.

ROHM & HAAS—Rohm & Haas Co., 222 West Washington Square, Philadelphia, Pa.

SANDOZ—Sandoz Chemical Works, Inc., 61-63 Van Dam Street, New York, N. Y.

SCHOLLER—Scholler Brothers, Inc., Collins and Westmoreland Streets, Philadelphia, Pa.

STODGHILL—Stodghill & Company, Atlanta, Ga.

TAYLOR—Taylor Instrument Companies, 141 Milk Street, Boston, Mass.

VAN VLAANDEREN—Van Vlaanderen Machine Company, Paterson, N. J.

VIRGINIA—The Virginia Smelting Company, Boston, Mass.

WHITEHEAD—Whitehead Metal Products Co., Inc., New York, N. Y.

WOLF—Jacques Wolf & Co., Passaic, N. J.

YOUNG—Young Aniline Works, Inc., Baltimore, Md.

YOUNGSTOWN—The Youngstown Welding & Engineering Co., Youngstown, Ohio.

ZINSSER—Zinsser & Co., Hastings-on-Hudson, N. Y.

ZURN—O. F. Zurn Company, 2736 No. Broad Street, Philadelphia, Pa.

A NEW CONTROL SYSTEM

For Hussong Dye Vats

A NEW automatic control system for Hussong dye vats was announced recently by The Bristol Company, Waterbury, Connecticut. This equipment is known as the Coordinated Control System. With it the operation of the Hussong dye vat can be carried out under complete automatic control from the dye master's office.

OPERATION

The dye master determines the time-temperature cycle to be followed for the particular dyeing operation in question. He places the proper time-temperature cam (a cam is available for each different schedule required by the various dyes—5 different cams are usually sufficient to take care of all requirements) on the controller, which is located in the laboratory on a panel in front of his desk (See illustration, Fig. 1). With the cam set in the starting position, he presses the starter button on the panel. Pressing the starter button does not, however, begin the dyeing operation, it merely signals by means of a light located at the vat to the floor man that everything is in readiness for operation when he has completed loading the dye vat cage, filled the vat to the proper level, and added whatever chemicals are required for the run. When everything is in readiness he presses a button at the vat and the process starts. The temperature of the solution in the vat is then automatically raised according to the exact rate cut on the cam and found to be most desirable for good results. This is probably the most important feature of the control system since it has been found that gradual and regular increase in temperatures to the "boil" is of paramount importance. Each color has its particular gradiant and any divergence from this is reflected by inferior dyeing.

The controller automatically takes care of the gradual rise in temperature to the "boil" and holds it at this point for a pre-determined length of time. At the end of the "boil" which may be an hour or more the process is halted automatically and a signal flashes to inform the operator that it is time for sampling. A second light flashes when temperature falls to a point permitting the addition of chrome. After the chrome has been added the operator pushes a starter button which again starts the process. This brings the temperature gradually up to the "boil" and holds it there for a predetermined time, at the end of which the signal light flashes. Corresponding lights in the laboratory tell the dyer at all times just how far the process is progressing. These lights also indicate to the dyer how carefully and promptly the floor man is taking care of his duties. Delays and inattention are immediately registered in the laboratory.

The Coordinated Control System not only takes care of automatically maintaining the most desirable time temperature schedule, but also automatically reverses the flow of solution in the vat. Reversals take place according to a set schedule determined by the dye master. It has been found that this particular feature contributes materially to the uniformity of color throughout the batch. It also eliminates any necessity of poling or dipping the basket to facilitate uniformity of dyeing.

The time temperature cams insure proper heating of the dye solution which is never certain without automatic control. In most dye rooms floor men usually are busy attending to a number of vats and are unable to follow the exact schedule found to be most desirable. Often steam valves are left wide open and forgotten until someone is forcefully reminded of this condition by the dye solution boiling over. Under automatic control hard boiling and

Fig. 1—Coordinated Control System in dye master's office.

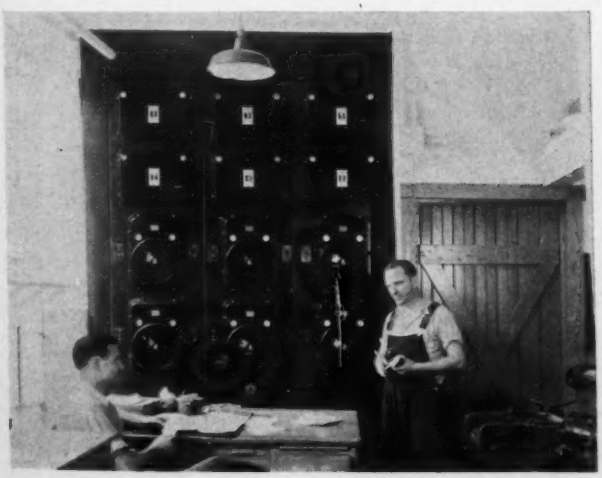


Fig. 2—Six dye vats under complete automatic control.

boiling over are completely eliminated even during the reversal, which causes the solution to flow from under to over the basket.

SUMMARY OF BENEFITS CLAIMED

1. The Coordinated Control System takes the control of the dyeing process out of the hands of the floor men and places it in the dye master's office.

2. The control system increases the tensile strength of the wool. In one case strength was increased as much as 17 per cent. This was due to temperature being held exactly at the scheduled point with no hard boiling or overheating.

3. Production is stepped up. In one plant production was increased from six runs per vat per day to ten to twelve runs per vat per day, an increase of between 70 and 100 per cent. This increase was brought about without adding additional men or increasing hours.

4. Coordinated Control makes it possible to secure a uniform color throughout the vat without assistance from the dyer or floor men.

5. Steam saving is effected. In one plant the steam pressure was reduced from 80 to 40 lbs. per sq. in. after control system was installed.

6. Boiling over of vats is completely eliminated thereby making a saving in color, chrome, water, and steam.

7. The control system frees the floor men and dyer for other work.

8. Since the complete dyeing operation can be kept under absolute control it is possible with the control system for the dye master to duplicate results day after day with formulas found to be correct.

9. If poling and other operations are found necessary in a particular plant they can be completely eliminated by the use of the Coordinated Control System.

WASHINGTON NEWS LETTER

WALDON FAWCETT

THE physical conditions attending the beginnings of the 75th Congress assure the advancement of the legislative program,—both as to resurrected and new proposals. As the first impetus, there is the circumstance that the new Congress, elected in November, 1936, will begin to function early in January 1937 instead of in December 1937, as would have been the procedure had the Constitution not been amended. Furthermore, by the new plan, the new Congress has a period of three weeks to devote to organization and hearings by Committees (notably the sub-committees of the Committee on Appropriations) prior to the inauguration of the President and delivery of his initial message to Congress.

A second and no less important impetus will be found in the inherited situation in respect to the Committees in which the real work of Congress is done. Ordinarily, in a new Congress, all legislation must wait upon the appointment of these Committees, perfection of their organization, and a preliminary evolution of policy within the Committees. This winter work in many of the leading Committees may be off to a flying start owing to a presumptive continuance of Committee control. Especially will this be true in the Senate. Whichever political party won the major victory in the November elections, it is all but inevitable that a number of Committee Chairman and majority Members will be undisturbed. This nucleus in committee will make it possible to promptly reintroduce and consider (and possibly report out) measures such as the Food, Drug and Cosmetic Bill and the Copyright Bill, with Design Amendment which were fully considered but not conclusively acted upon in the last Congress.

STATE LEGISLATION TO BE RECKONED WITH

For the forces of research and industry, the enigma of the coming season is found not so much in Congress as in the legislatures of the several States. The experimental contingencies of State legislation are always present in degree. This season, more rather than less owing to the fact that no less than 44 State Legislatures, almost the full membership of the Union, are scheduled to hold sessions in 1937. In routine measures covering administrative regulations and enforcement, State legislatures are supposed to, as a rule, follow the lead of Congress, for the sake of standardization. Always, though, there is the chance of State experimentation with issues which in Congress have, advisedly, been held in abeyance. This impatience is well illustrated, currently, by the State laws imposing sales taxes and by the various versions of Fair Trade Acts designed to legalize the fixing of uniform resale prices on trade marked goods.

In the matter of food and drugs legislation most of the State legislatures have usually been amenable to Federal example and initiative. Thus there should be little to apprehend in the State legislative sequel to a new Federal Food Act which, as heretofore drafted, contemplates little change in the certification system operative in the field of food colors. There is, even so, always a chance that enthusiasts in an isolated State legislature will indulge ambition to exceed Federal censorship, as has been illustrated by measures, here and there, designed to compel disclosure of formulas.

RESEARCH STAKE IN ROBINSON-PATMAN ACT

A fruitful field for conjecture, as soon as the results of the November elections are known, will concern the temper of the new Congress in respect to repeal or amend-

ment of the Robinson-Patman Act, sometimes referred to as the Anti-Price Discrimination law, which was enacted late in the last session as a result of the revelations of the Chain Store Investigation. The forces of business have been hopelessly confused and perplexed by the uncertainties of the interpretation and application of this law which penalizes favoritism in discounts, advertising or service allowances etc. The fog has not been relieved by the refusal of the Federal Trade Commission to prerule upon the moot questions involved, pending pronouncements by the higher Federal courts. Which situation has nurtured a movement in trade association circles for revision or amendment of the Act.

Primarily affected, not at all, by the so-called Equal-Opportunity-in-Business statute, technical research may feel the impact of certain trends which have been instigated by the limitations imposed upon bargaining by large buyers. For example, there is the effect of the impulse upon large distributors, such as national chains and mail order houses, to insure to themselves the benefits of quantity purchase by developing their own, or exclusively-controlled sources of supply for goods under private brand. Really ambitious recourse to this escape from the new legislation would presumably involve considerable research work, preparatory to new products and an increase in the volume of technical testing to verify products purchased on specification for distributor-labeling.

U. S. BULLETIN ON HOME DYEING

The U. S. Department of Agriculture has given wide distribution to its Miscellaneous Publication No. 230,—a monograph on "Home Dyeing With Natural Dyes" by Margaret S. Furry, Assistant Textile Chemist and Bess M. Viemont, Assistant Textile Specialist of the Division of Textiles of the Bureau of Home Economics. By way of warrant for issuance of the 36-page document at this time it is stated that the present widespread interest in handicraft work has brought to the Department a demand for reliable information on the use of tree barks, nut hulls and other natural dyestuffs gathered locally. In the Introduction appears comment as follows: "Though for most purposes the synthetic dyes manufactured by commercial chemical processes are more satisfactory, there are certain qualities about natural dyes that give them commercial value in handicraft work, and many handicraft workers prefer to use the mon material for hooked rugs, hand-woven scarfs, coverlets and other articles they make for sale." It is noted that samples of all the dyes studied in the experiments were given standard tests for color fastness and that many were discarded as unsatisfactory. A list is appended of plant materials, sometimes recommended, that do not produce fast colors on wool or cotton.

NATIONAL ARCHIVES—NEW RESEARCH CENTER

Technical circles have not, perhaps, fully sensed the resources of the latest reference reservoir which has been placed at their disposal. The consolidation, classification and preservation of the records of the various agencies of the Federal Government is a project which has been perennially discussed for years. In fact ever since the beginning of the 19th century when occurred the first of a series of fires which destroyed irreplaceable documents. For all the incentative it is only at this late day we find the National Archives an accomplished fact.

In completeness of facilities and accommodations for research workers, official or lay, there is compensation in the building which has lately completed at Washington at a cost upward of $12,000,00. And which provides 2,500,-000 cubic feet of space for archives. Stacks in sealed rooms, fortified against every destructive element, yet easy of access. With special provision for every modern form of reference material, even to significant motion picture films and sound recordings.

For technical men on the trail of data buried in any Governmental institution in Washington there is benefit in the National Archives if it did no more than unify and reconcile the assorted systems of classification and indexing that have grown up. The need for reform may be surmised from the circumstance that the Archives staff found over 250 different systems of classification in use in the various Departments.

Not the least of the boons for the layman in the creation of the National Archives is the provision of facilities calculated to enable any research worker not only to consult documents. etc. on file but to, at nominal expense, and at short notice, obtain copies of records for his personal or corporate files. This is accomplished by a duplicating division which produces photographic or photostatic copies of documents. Incidentally, the technique in this Division has a hint for research institutions in one of its space-saving expedients. For the sake of rendering files complete there are made reduced-size photographic copies of many documents not considered of sufficient importance to warrant preservation of the originals. Included among the features of the new Archives Building is a Search Room for the use of research workers, which probably has no equal, unless it be in the Search Room at the U. S. Patent Office.

DIVISION OF INDUSTRIAL ECONOMICS PROPOSED

Executives at the U. S. Department of Commerce are considering the advisability of asking of Congress authority for the creation of a new unit within the Bureau of Foreign and Domestic Commerce, to be known as the Division of Industrial Economics. The inspiration for the projected additional cog is found in the success which has attended the activities of a similar division (Bureau of Agricultural Economics) in the Department of Agriculture. It is just possible that there is, at Commerce headquarters, an impulse to forestall invasion of investigative fields accounted clearly within the Commerce jurisdiction. Certain marketing studies by the Agricultural Economics organization have explored aspects of distribution which involve non-agricultural as well as agricultural products.

Should the addition be made to the Commerce Depart-

ment set-up, fine distinctions may have to be drawn to separate the jurisdiction of the new clearing house of information on distribution from the spheres of other Economic Divisions in the Commerce Directory. Notably the comparatively new Division of Marketing Research and Service which is engaged currently in such activities as the series of Studies of Consumer Use of Selected Commodities and the improvement of the system whereby check is kept on the introduction of new industrial products and new consumer products.

For textile chemists there may be, also, some interest in the question of what latitude would be allowed the proposed new Division in its contacts with the existing Division of Regional Information, a unit that is of concern to this audience because it supplements and supports the commodity and technical work of the Industrial Divisions of the Bureau, one of which is the Chemicals Division. By the by, in anticipation of possible leniency in the new Congress, there is, in several quarters, a restirring of agitation for the establishment of additional Industrial Divisions or Commodity Divisions. As thus far outlined none of these recurrent ambitions come close to chemical or textile interests. For the most part the budding projects contemplate the establishment of separate Divisions for commodity lines now embraced within the Division of Specialties.

ONCE AGAIN "GOVERNMENT REORGANIZATION"

Nothing better betokens the fact that certain political fashions are unchanging than the reappearance in the campaign of 1936 of the implied promise that the near future shall see realization of the age-old dream of reorganization of the administrative branch of the Government. This latest version of the perennial mirage is, if anything, more colorful than some of its predecessors. In that it hints that major Departments may be abolished or absorbed incident to the reputed termination of duplication of Governmental activities.

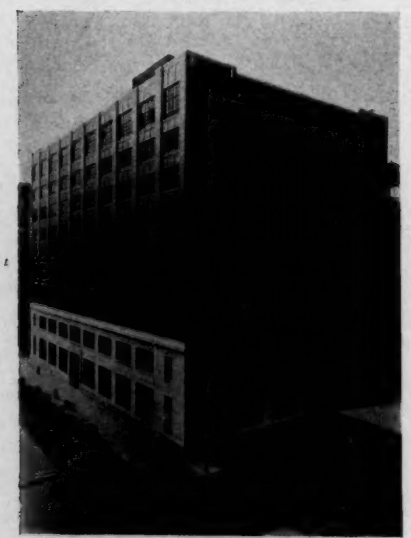
For all that the well-worn political palliative can be taken for only what it is worth the fact remains that each successive year piles additional evidence of the blessings that might be brought to textile-chemical interests by a thorough, impartial conscientious reorganization and consolidation of the executive and investigational activities of the Government. Indeed, the Government's prime example of hit-and-miss decentralization, with consequent duplication or extensive overlapping of activities, is to be found in the sundry laboratories and Divisions of Chemistry, each attached to and serving a single Bureau. It is recalled, too, that every qualified specialist who has worked on the successive plans for Government reorganization, has strongly recommended that the textile testing, etc., in which various bureaus of the Department of Agriculture have dabbled should, for the sake of efficiency and economy, be transferred to the National Bureau of Standards. In any event, not before December 1 would the first move be made in the survey that is to provide yet another plan of reorganization.

TRADE NOTES — NEW PRODUCTS

● NEW GENERAL DYESTUFF BUILDING

Every departmental activity of the General Dyestuff Corporation is now coordinated under one roof in a newly erected nine-story building located at 435 Hudson Street, between Leroy and Morton Streets, New York City. With the exception of a half floor tenanted by the General Aniline Works, for which GDC is sole selling agent, the company occupies the entire building. It is said to be modern in every respect and to offer not only every facility for the efficient operation of their executive and general offices but also ample space for their main laboratories, shipping and warehouse rooms.

New General Dyestuff Building



It is stated that General Dyestuff Corporation's activities are thus centralized and modernized to meet the increasing demands of industry for complete service and a comprehensive line of dyestuffs for wool, cotton, silk, rayon, paper, leather, paints, dry colors, resins and various other products requiring colors or allied materials.

The new structure is said to be the largest of its type to be erected in the city within five years. It is so constructed as to permit the erection of three additional stories should increased business warrant further expansion. Many of its interior features are exceptional. For instance many of the wall partitions are of the new structural glass brick.

● NATIONAL RELEASE

National Aniline & Chemical Co., Inc., announces release of a bulletin on the following new product:

National Milling Yellow X N—an addition to the National line of Milling Yellows which is said to be important, not only for its usefulness on wool and silks, but particularly for its good covering power on all kinds of leathers, especially chrome tanned leathers. It produces considerably greener tones than National Milling Yellow 3 G and is said to possess excellent solubility and to have the necessary fastness to sea water, washing, fulling, carbonizing, perspiration and rubbing to recommend it for the dyeing of slubbing and knitting yarns for bathing suits and sweaters. It is stated that this product is excellent for the printing trade, both for direct application and for white discharge work. Bulletin No. 207.

● PHILADELPHIA QUARTZ BOOKLET

The Philadelphia Quartz Co. announces release of a booklet entitled *Metso 99, Sodium Sesquisilicate, For Modern Industry's Cleaning Needs.* It is stated that the product Metso 99, which is described in this booklet, gives fast, economical, controlled and thorough cleaning. Copies of the booklet are available upon request.